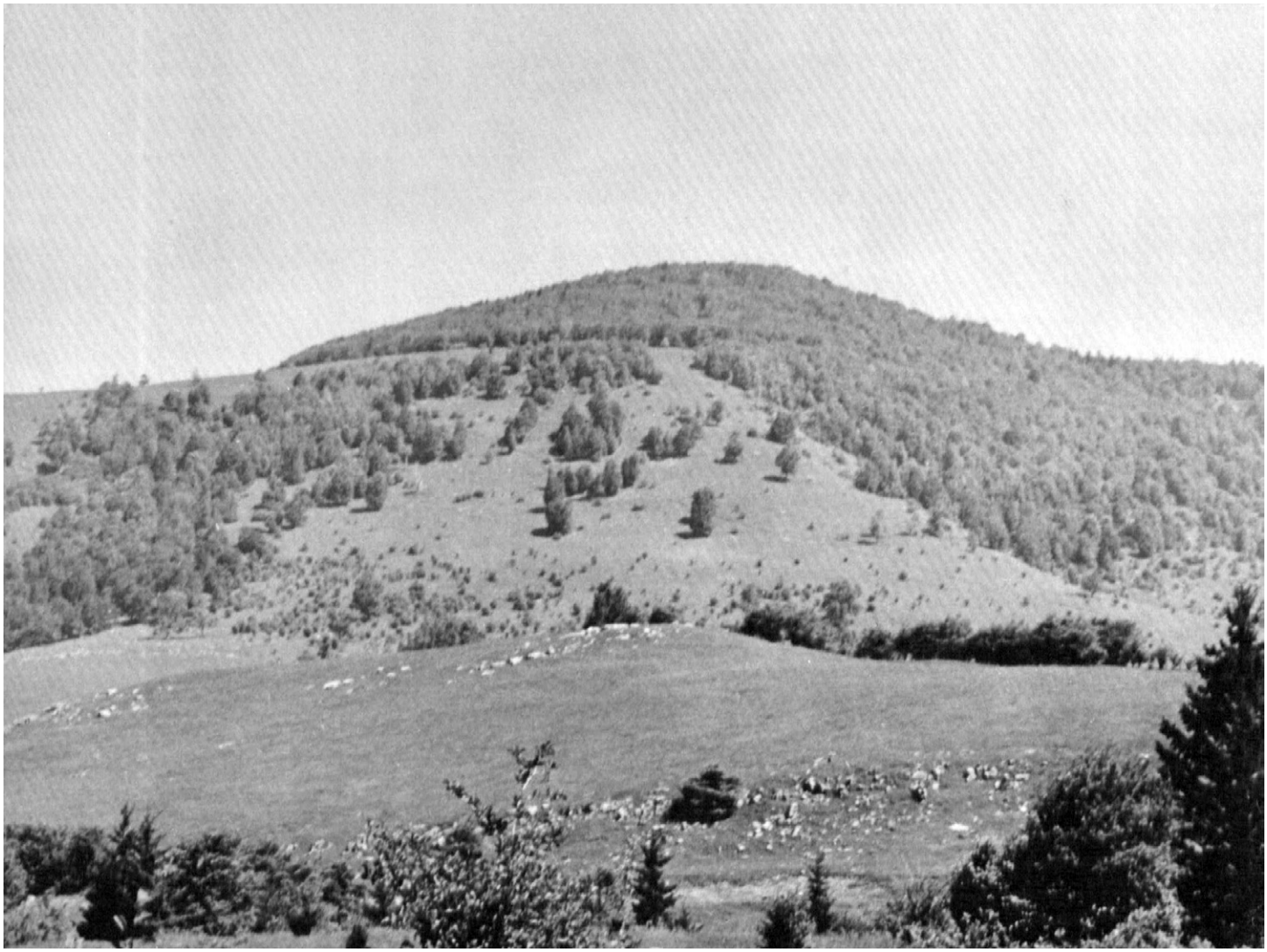
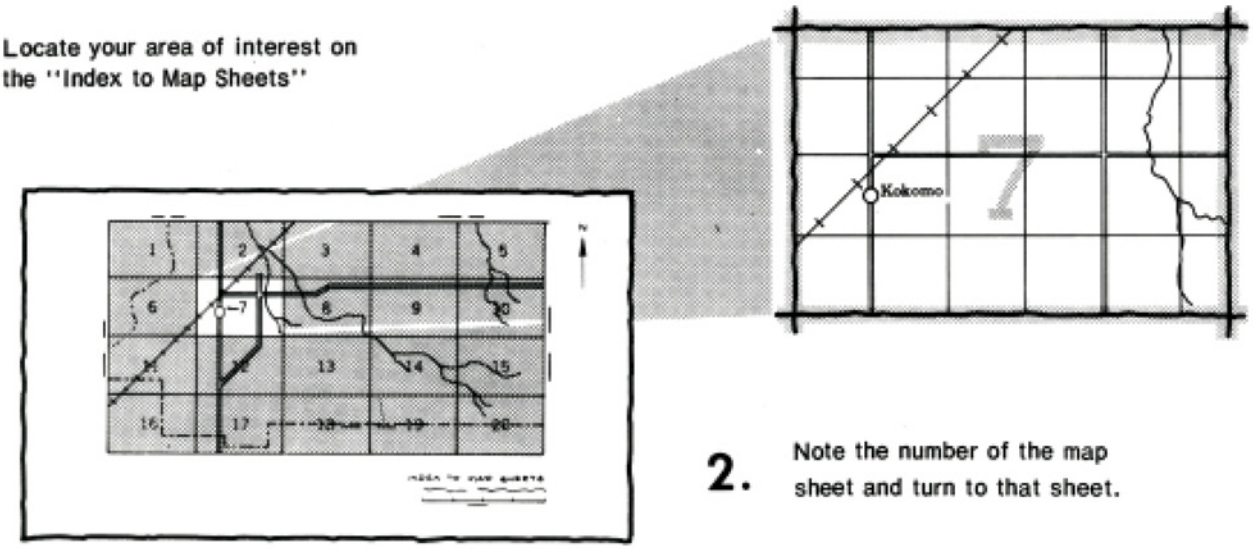
Soil Survey of
Randolph County Area, Main Part, West Virginia

United States Department of Agriculture
Soil Conservation Service and Forest Service
in cooperation with
West Virginia University Agricultural Experiment Station



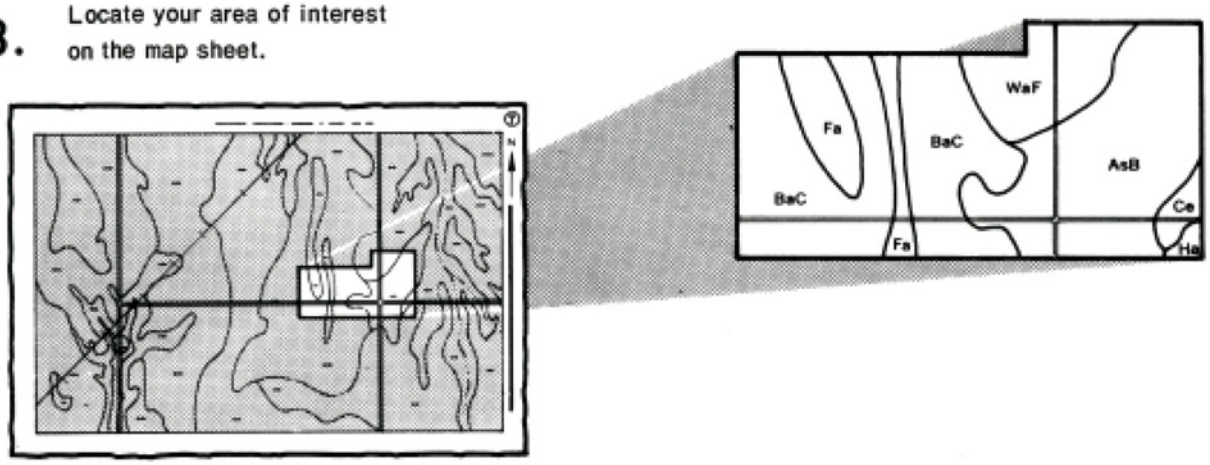
HOW TO USE

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

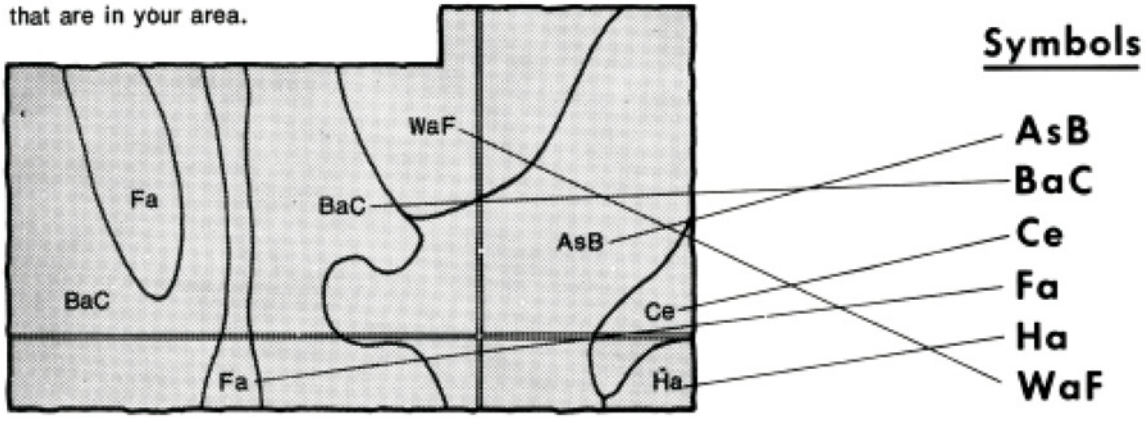


2. Note the number of the map sheet and turn to that sheet.

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

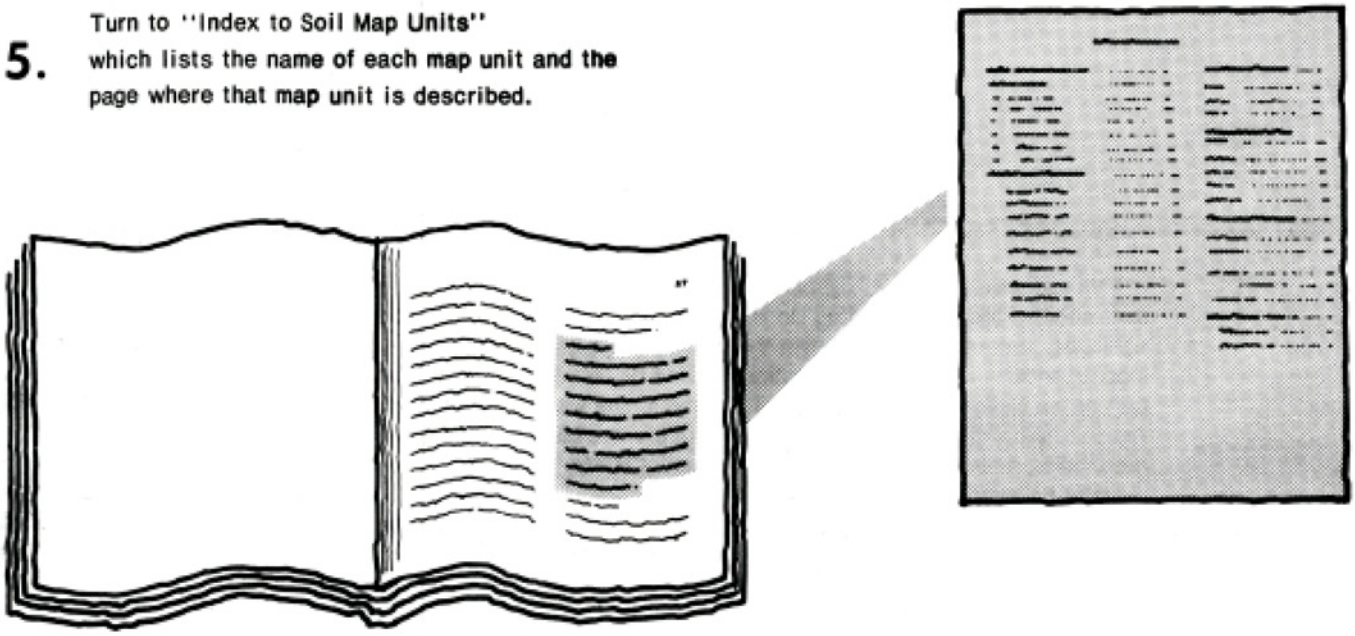


4. List the map unit symbols that are in your area.

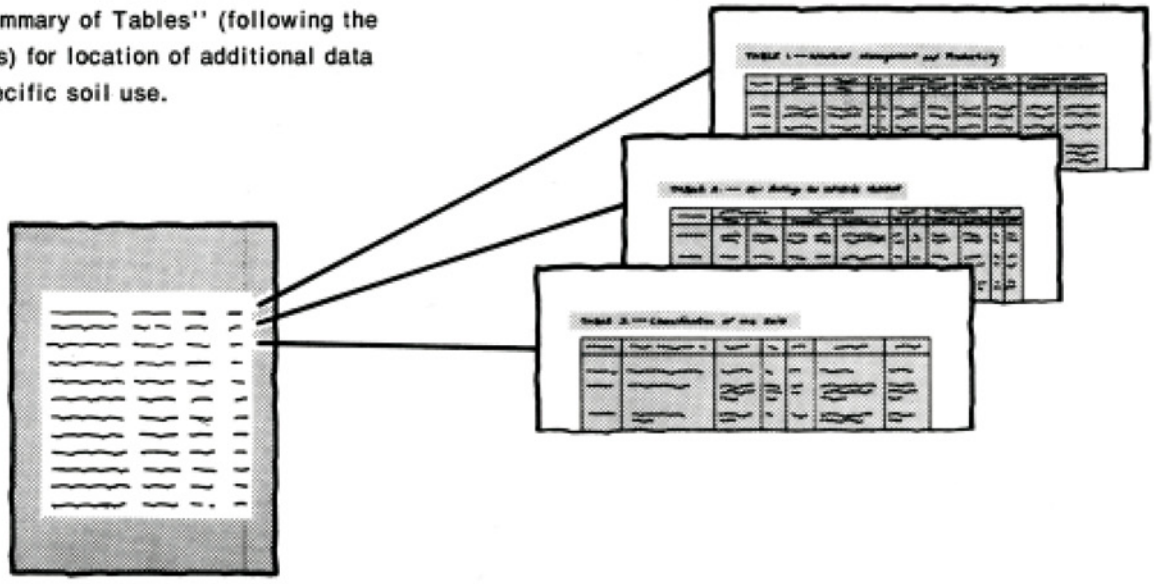


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was performed in the period 1969-77. Soil names and descriptions were approved in 1978. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1978. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the West Virginia University Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Tygart Valley Soil 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.

Cover: A typical landscape in the Calvin high base substratum-Belmont-Meckesville association.

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Issued August 1982

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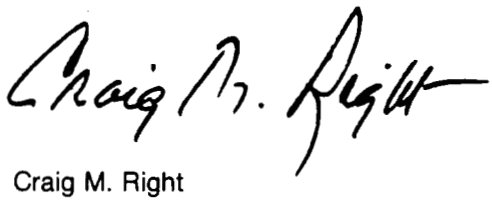
foreword

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

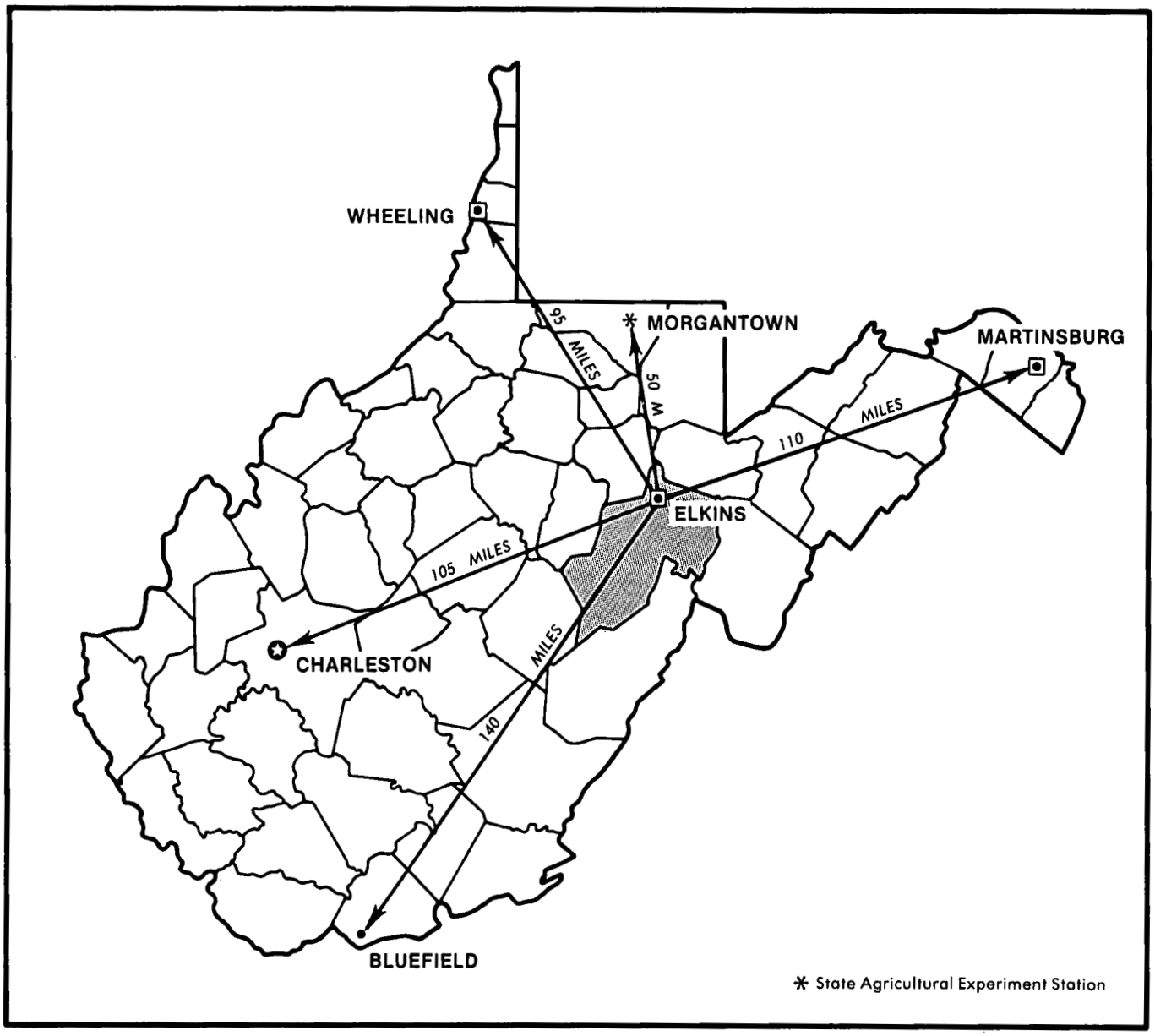
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to 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.



Craig M. Right
State Conservationist
Soil Conservation Service



Location of Randolph County in West Virginia.

Soil survey of

Randolph County Area Main Part, West Virginia

By Roy E. Pyle, Woodrow W. Beverage, Troy Yoakum, Denver P. Amick, William F. Hatfield, and David E. McKinney, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with West Virginia University Agricultural Experiment Station

RANDOLPH COUNTY is in the east-central part of West Virginia. The county has a total area of 663,040 acres, or 1,036 square miles, 599,469 acres of which was surveyed for this report. The remaining 63,571 acres was included in the Soil Survey of Tucker County and Part of Northern Randolph County, published in 1967.

The population of Randolph County in 1970 was 24,596. Elkins, the county seat, had a population of 8,200, making it the largest city in the survey area.

The elevation of the county ranges from 1,750 feet above sea level at Laurel to 4,760 feet at Roaring Plains.

General nature of the area

Settlement

The first settlements in the area of Randolph County were made in 1753 on Files Creek and at Valley Bend.

Randolph County, the largest county in the State, was organized in 1787 from part of Harrison County and named in honor of Edmund Jennings Randolph, Governor of Virginia from 1786 to 1789.

Elkins, the county seat, was established in 1889. The town of Beverly is the oldest in the county and was the county seat from 1787 to 1898.

Farming

The 1974 Census of Agriculture (*7*) reports 392 farms in Randolph County and a total farm acreage of 134,667.

The main types of farming in the county are raising beef cattle, sheep, and hogs; dairying; and producing corn, some wheat and oats, pasture, and hay. Cattle provide the greatest source of farm income. According to the 1970 West Virginia Soil and Water Conservation Needs Inventory (*6*), the total acreage in cropland and pasture was about 84,500 acres.

Climate

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

Winters are cold and snowy at high elevations in Randolph County. The valleys are also frequently cold, but intermittent thaws preclude a long-lasting snow cover. Summers are fairly warm on mountain slopes and very warm with occasional very hot days in the valleys. Rainfall is evenly distributed during the year, but it is appreciably heavier on the windward, west-facing slopes than in the valleys. Normal annual precipitation is adequate for all crops, although summer temperature and growing season length, particularly at higher elevations, may be inadequate.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Elkins, West Virginia, for the period 1951 to 1974. 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 31 degrees F, and the average daily minimum temperature is 20 degrees. The lowest temperature on record, which occurred at Elkins on February 27, 1963, is -21 degrees. In summer the average temperature is 67 degrees, and the average daily maximum temperature is 80 degrees. The highest recorded temperature, on September 3, 1953, is 97 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.

Of the total annual precipitation, 23 inches, or 55 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 21 inches. The heaviest 1-day rainfall during the period of record was 3.71 inches at Elkins on October 15, 1954. Thunderstorms occur on about 45 days each year, and most occur in summer.

Average seasonal snowfall is 59 inches. The greatest snow depth at any one time during the period of record was 20 inches. On an average of 27 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 in spring is less than 55 percent; during the rest of the year it is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The prevailing direction of the wind is from the northwest. Average windspeed is highest, 8 miles per hour, in March.

Heavy rains, which occur at any time of the year, and severe thunderstorms in summer sometimes cause flash flooding, particularly in narrow valleys.

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 on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

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 for broad land use planning" 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, woodland managers, engineers, planners, developers and builders, home buyers, and others.

General soil map for broad land use planning

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.

Descriptions of map units

1. Gilpin-Dekalb-Lily association

Gently sloping to very steep, well drained, acid soils; on uplands

This association consists of broad ridgetops, steep and very steep hillsides, and narrow valleys. Much of the acreage has stones on the surface.

The association makes up about 7 percent of the survey area. It is about 28 percent Gilpin soils, 26 percent Dekalb soils, 12 percent Lily soils, and 34 percent minor soils.

The Gilpin soils are moderately deep and strongly sloping to very steep. They formed in material weathered from interbedded shale, siltstone, and sandstone. Gilpin soils have a black to dark grayish brown, channery, medium-textured surface layer and a yellowish brown, medium-textured and moderately fine textured subsoil that is channery in the lower part.

The Dekalb soils are moderately deep and strongly sloping to very steep. They formed in material weathered from sandstone and some interbedded siltstone and shale. Dekalb soils have a very dark brown to brown,

channery, medium-textured surface layer and a yellowish brown, channery, moderately coarse textured subsoil.

The Lily soils are moderately deep and gently sloping to strongly sloping. They formed in material weathered from sandstone and some interbedded siltstone and shale. Lily soils have a black to brown, medium-textured and moderately coarse textured surface layer and a yellowish brown, moderately fine textured subsoil that is channery in the lower part.

The minor soils in the association are Cookport Variant soils on ridgetops and benches; Buchanan and Ernest soils on foot slopes; and Atkins, Chavies, Pope, and Philo soils on narrow flood plains.

Most of this association is wooded. Some areas in the northern part are farmed. The erosion hazard is generally moderate to severe. Slope and the limited depth to bedrock are the main limitations for nonfarm use of the major soils. A high water table, moderately slow and slow permeability, and a hazard of flooding are the main limitations of the minor soils.

2. Gilpin-Dekalb-Buchanan association

Strongly sloping to very steep, well drained and moderately well drained, acid soils; on mountainous uplands and foot slopes

This association mainly consists of broad ridgetops, steep and very steep hillsides, and strongly sloping and moderately steep foot slopes. Narrow flood plains cover part of the association. Stones cover the surface of much of the acreage, and some areas have exposed bedrock.

This association makes up about 22 percent of the survey area. It is about 25 percent Gilpin soils, 23 percent Dekalb soils, 12 percent Buchanan soils, and 40 percent minor soils.

The Gilpin soils are moderately deep, well drained, and strongly sloping to very steep and are on uplands. The soils formed in material weathered from interbedded shale, siltstone, and sandstone. Gilpin soils have a black to dark grayish brown, channery, medium-textured surface layer and a yellowish brown, medium-textured and moderately fine textured subsoil that is channery in the lower part.

The Dekalb soils are moderately deep, well drained, and strongly sloping to very steep and are on uplands. The soils formed in material weathered from sandstone and some interbedded siltstone and shale. Dekalb soils have a very dark brown to brown, channery, medium-textured surface layer and a yellowish brown, channery, moderately coarse textured subsoil.

The Buchanan soils are deep, moderately well drained, and strongly sloping to moderately steep and are on foot slopes. The soils formed in colluvial material that moved downslope from soils on uplands. Buchanan soils have a very dark gray to brown, medium-textured surface layer and brown to light yellowish brown, channery, medium-textured and moderately fine textured subsoil that is mottled in the lower part.

The minor soils in the association are Cookport Variant soils on ridgetops and benches; Ernest soils on foot slopes; Brinkerton Variant soils around stream heads and in saddles and depressions on uplands; and Atkins, Pope, and Pope Variant Soils and Fluvaquents and Udifluvents on narrow flood plains.

Most of this association is wooded. Some areas near Helvetia and Pickens are farmed. The hazard of erosion is moderate or severe. Slope, limited depth to bedrock, a high water table, and moderately slow and slow permeability are the main limitations for nonfarm use of the major soils. A hazard of flooding is a limitation for the minor soils on flood plains.

3. Calvin high base substratum-Belmont-Meckesville association

Gently sloping to very steep, well drained, acid and lime-influenced soils; on mountainous uplands and foot slopes

This association consists of narrow ridgetops, broad benches, steep and very steep hillsides, and strongly sloping to moderately steep foot slopes. Bedrock is exposed on the surface of some of these areas, and stones cover much of the acreage.

The association makes up about 16 percent of the survey area. It is about 58 percent Calvin high base substratum soils, 17 percent Belmont soils, 12 percent Meckesville soils, and 13 percent minor soils.

The Calvin high base substratum soils are moderately deep and gently sloping to very steep. They formed in acid and lime-influenced material weathered from siltstone and shale and some interbedded sandstone. These soils have a dark brown, medium-textured surface layer and a reddish brown and dark reddish brown, channery, moderately fine textured subsoil.

The Belmont soils are deep and gently sloping to very steep. They formed in lime-influenced material weathered mainly from limestone interbedded in some areas with shale, siltstone, and sandstone. Belmont soils have a brown or dark brown, medium-textured surface layer and a reddish brown, moderately fine textured subsoil.

The Meckesville soils are deep and strongly sloping and moderately steep. They formed in acid and lime-influenced colluvial material that moved downslope from soils on uplands. Meckesville soils have a dark reddish gray, medium-textured surface layer and a reddish brown and dark reddish brown, gravelly, medium-textured and moderately fine textured subsoil that is mottled in the lower part.

The minor soils in the association are Dekalb soils on uplands; Shouns soils on foot slopes; and Atkins, Pope, and Pope Variant soils and Fluvaquents and Udifluvents on narrow flood plains.

Most of the association is wooded. Some of the Belmont and Calvin soils are used for pasture or hay. The hazard of erosion is moderate to severe. Slope and

the limited depth to bedrock are the main limitations for nonfarm use of the major soils in the association. A hazard of flooding and a high water table limit use of the minor soils on flood plains.

4. Berks-Calvin-Weikert association

Strongly sloping to very steep, well drained, acid soils; on uplands

This association consists of rounded hills at the foot of higher, very steep hills and narrow ridgetops. This association is adjacent to terraces and flood plains of the Tygart Valley River and Leading Creek. Bedrock is exposed at the surface in some areas, especially those that are steep or very steep (fig. 1).

The association makes up about 19 percent of the survey area. It is about 60 percent Berks soils, 20 percent Calvin soils, 9 percent Weikert soils, and 11 percent minor soils.

The Berks soils are moderately deep. They formed in material weathered from interbedded shale, siltstone, and fine-grained sandstone. Berks soils have a very dark grayish brown, channery, medium-textured surface layer and a yellowish brown, channery, medium-textured subsoil.

The Calvin soils are moderately deep. They formed in material weathered from interbedded shale, siltstone, and sandstone. Calvin soils have a dark reddish brown and dark reddish gray, channery, medium-textured surface layer and a reddish brown, channery, medium-textured subsoil.

Figure 1. Rock outcrop in an excavation in the Berks-Calvin-Weikert association.

The Weikert soils are shallow. They formed in material weathered mainly from shale and siltstone. Weikert soils have a dark brown, shaly, medium-textured surface layer and a brown, very shaly, medium-textured subsoil.

The minor soils in the association are Dekalb soils on uplands; Ernest soils on foot slopes; and Atkins, Pope, and Pope Variant soils and Udifluvents on narrow flood plains.

Most of the association is wooded. Some areas near the Tygart Valley River are farmed. The hazard of erosion is moderate to severe. Slope and the limited depth to bedrock are the main limitations for nonfarm use of the major soils. A high water table, moderately slow and slow permeability, and a hazard of flooding limit use of the minor soils.

5. Ernest-Atkins-Monongahela-Philo association

Moderately steep to nearly level, moderately well drained to poorly drained, acid soils; on foot slopes, flood plains, and terraces

This association consists of soils along the Tygart Valley River and Leading Creek.

The association makes up about 8 percent of the survey area. It is about 15 percent Ernest soils, 9 percent Atkins soils, 6 percent Monongahela soils, 5 percent Philo soils, and 65 percent minor soils and water.

The Ernest soils are deep, moderately well drained, and gently sloping to moderately steep and are on foot slopes. Small areas have stones on the surface. The soils formed in colluvial material that moved downslope from soils on uplands. Ernest soils have a dark grayish brown, medium-textured surface layer and a pale brown, shaly, moderately fine textured subsoil that is mottled in the lower part.

The Atkins soils are deep, poorly drained, and nearly level and are on flood plains. The soils formed in alluvial material washed from soils on uplands. Atkins soils have a dark grayish brown and gray, mottled, medium-textured surface layer and a gray, mottled, medium-textured subsoil.

The Monongahela soils are deep, moderately well drained, and nearly level to strongly sloping and are on terraces. The soils formed in alluvial material washed from soils on uplands. Monongahela soils have a dark brown, medium-textured surface layer and a yellowish brown and light yellowish brown, medium-textured subsoil that is mottled in the lower part.

The Philo soils are deep, moderately well drained, and nearly level and are on flood plains. The soils formed in alluvial material washed from soils on uplands. Philo soils have a very dark grayish brown, medium-textured surface layer and a dark yellowish brown and brown or dark brown, medium-textured subsoil that is mottled in the lower part.

The minor soils in the association are Kanawha, Kanawha Variant, Linden, Philo Variant, Pope, and Pope Variant soils and Udifluvents on flood plains; and Balgo, Purdy, Tygart, Tygart Variant, and Zoar soils on terraces. Small areas of Berks and Weikert soils are in the northern part of the association.

Some areas of this association are used for farming, and some are urbanized (fig. 2). The erosion hazard is slight to moderate. A hazard of flooding, a high water table, and moderately slow and slow permeability are the main limitations for nonfarm use of the major soils. Slope and a limited depth to bedrock limit use of some of the minor soils.

6. Dekalb-Buchanan association

Strongly sloping to very steep, well drained and moderately well drained, acid soils; on mountainous uplands and foot slopes

This association is in the Shavers Fork drainage area. It consists of ridgetops and steep hillsides and foot slopes. Stones cover the surface of much of the association.

The association makes up about 16 percent of the survey area. It is about 50 percent Dekalb soils, 15 percent Buchanan soils, and 35 percent minor soils.

The Dekalb soils are moderately deep, well drained, and strongly sloping to very steep and are on uplands. The soils formed in material weathered from sandstone and some interbedded siltstone and shale. Dekalb soils have a brown, channery, medium-textured surface layer and a yellowish brown, channery, moderately coarse textured subsoil.

The Buchanan soils are deep, moderately well drained, and strongly sloping to moderately steep and are on foot slopes. The soils formed in colluvial material that moved downslope from soils on uplands. Buchanan soils have a very dark gray to brown, medium-textured surface layer

Figure 2. A developed area in the Ernest-Atkins-Monongahela-Philo association.

and a brown to light yellowish brown, channery, medium-textured and moderately fine textured subsoil that is mottled in the lower part.

The minor soils in the association are Cookport Variant, Gilpin, and Leetonia soils mainly on broad ridgetops and benches; Ernest soils on foot slopes; Brinkerton Variant soils around stream heads and in saddles and depressions on uplands; and Pope soils and Udifluvents on narrow flood plains mainly along Shavers Fork.

The association is mostly wooded. Erosion is moderate in most areas. Slope, a limited depth to bedrock, a high water table, moderately slow and slow permeability, and a stony surface are the main limitations for nonfarm use of the major soils. The hazard of flooding limits use of the minor soils on flood plains.

7. Dekalb-Berks-Calvin association

Strongly sloping to very steep, well drained, acid soils; on mountainous uplands

This association consists of broad ridgetops and steep hillsides in the eastern part of the survey area. Exposed bedrock is on the surface of some areas, and some areas of Dekalb soils have stones on the surface.

The association makes up about 11 percent of the survey area. It is about 35 percent Dekalb soils, 30 percent Berks soils, 15 percent Calvin soils, and 20 percent minor soils.

The Dekalb soils are moderately deep. They formed in material weathered from sandstone and some interbedded siltstone and shale. Dekalb soils have a brown, channery, medium-textured surface layer and a yellowish brown, channery, moderately coarse-textured subsoil.

The Berks soils are moderately deep. They formed in material weathered from interbedded shale, siltstone, and fine-grained sandstone. Berks soils have a very dark grayish brown, channery, medium-textured surface layer and a yellowish brown, channery, medium-textured subsoil.

The Calvin soils are moderately deep. They formed in material weathered from interbedded shale, siltstone, and sandstone. Calvin soils have a dark reddish brown and dark reddish gray, channery, medium-textured surface layer and a reddish brown, channery, medium-textured subsoil.

The minor soils in the association are Gilpin soils on uplands; Brinkerton Variant and Ernest soils on foot slopes and along drainageways; and Atkins, Pope, and Pope Variant soils and Fluvaquents and Udifluvents on narrow flood plains.

This association is mostly wooded. The erosion hazard is moderate to severe in most areas. Slope and a limited depth to bedrock are the main limitations for nonfarm use of the major soils. A high water table, moderately slow and slow permeability, and a hazard of flooding limit use of the minor soils.

8. Dekalb-Brinkerton Variant association

Gently sloping to very steep, well drained and somewhat poorly drained, acid soils; on mountaintops

This association consists mostly of soils on broad ridgetops in the northeastern part of the survey area. Stones and boulders cover much of the surface of the association.

The association makes up about 1 percent of the survey area. It is about 52 percent Dekalb soils, 20 percent Brinkerton Variant soils, and 28 percent minor soils.

The Dekalb soils are moderately deep, well drained, and strongly sloping to very steep. They formed in material weathered from sandstone and some interbedded siltstone and shale. Dekalb soils have a brown, channery, medium-textured surface layer and a yellowish brown, channery, moderately coarse textured subsoil.

The Brinkerton Variant soils are deep, somewhat poorly drained, and gently sloping to strongly sloping. They formed in material that moved downslope from the uplands. Brinkerton Variant soils have a black to brown, medium-textured surface layer and a mottled, strong brown, channery and shaly, moderately fine textured subsoil.

The minor soils in the association are Leetonia soils on uplands and Ernest soils on foot slopes and along drainageways. Stones and boulders cover 90 percent or more of some areas.

The association is wooded and is used mostly for recreation and wildlife habitat. The erosion hazard is moderate on most areas. Slope, the limited depth to bedrock, a high water table, slow permeability, and the stones and boulders on the surface are the main limitations for nonfarm use of the soils.

Soil maps for detailed planning

Dr. John Sencindiver, assistant professor of soil science, West Virginia University Agricultural Experiment Station, assisted with the preparation of this section and the section "Soil series and morphology."

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, a brief description of the

soil, and a listing of the principal hazards and limitations to be considered in planning management.

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 layers 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, Berks channery silt loam, 15 to 25 percent slopes, is one of several phases in the Berks series.

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

A *soil complex* consists of two or more soils 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. Berks-Weikert complex, 8 to 15 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. Buchanan and Ernest stony soils, 3 to 15 percent slopes, is an undifferentiated group in this survey area.

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

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

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

Soil descriptions

At—Atkins silt loam. This soil is nearly level and poorly drained. It is on flood plains mainly along the Tygart Valley River and Leading Creek and their tributaries.

Typically the surface layer is dark grayish brown silt loam about 4 inches thick underlain by 10 inches of gray heavy loam with brown mottles. The subsoil is 34 inches thick. It is gray, very friable heavy loam with brown mottles. The substratum is mixed gray and brown sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Philo soils and poorly drained or very poorly drained Purdy soils. Also included are a few small areas of soils that have a thick, black surface layer; soils that have a surface layer of fine sandy loam or loam; and soils that have a subsoil of fine sandy loam, sandy loam, or silty clay. Included soils make up about 25 percent of this map unit.

The available water capacity of this Atkins soil is high. Permeability is slow or moderately slow in the subsoil. Runoff is slow, and water is ponded on the surface in some areas. Natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. This Atkins soil has a seasonal high water table at or near the surface which restricts the root zone of many types of plants, and the soil is commonly flooded (fig. 3). The depth to bedrock is generally greater than 5 feet.

This soil is suited to cultivated crops but is better suited to hay or pasture plants that tolerate wetness; the soil is used mainly for hay or pasture. Artificial drainage is needed for cultivated crops or for hay or pasture, and providing drainage is a major farming management concern. Most areas lack suitable drainage outlets, but in places diversions help to intercept runoff from higher areas. If this soil is cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Flooding is a hazard for crops in some areas of this soil. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is firm are major pasture management needs.

The soil has very high potential for trees that tolerate wetness, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The hazard of flooding, the seasonal high water table, the slow permeability, and a frost action potential limit the soil for most nonfarm uses. Establishing plant cover on unprotected areas and providing for proper surface water disposal help to control stream scouring and sedimentation.

The capability subclass is IIIw.

BaB—Belmont silt loam, 3 to 8 percent slopes. This soil is gently sloping and well drained and is mostly on benches.

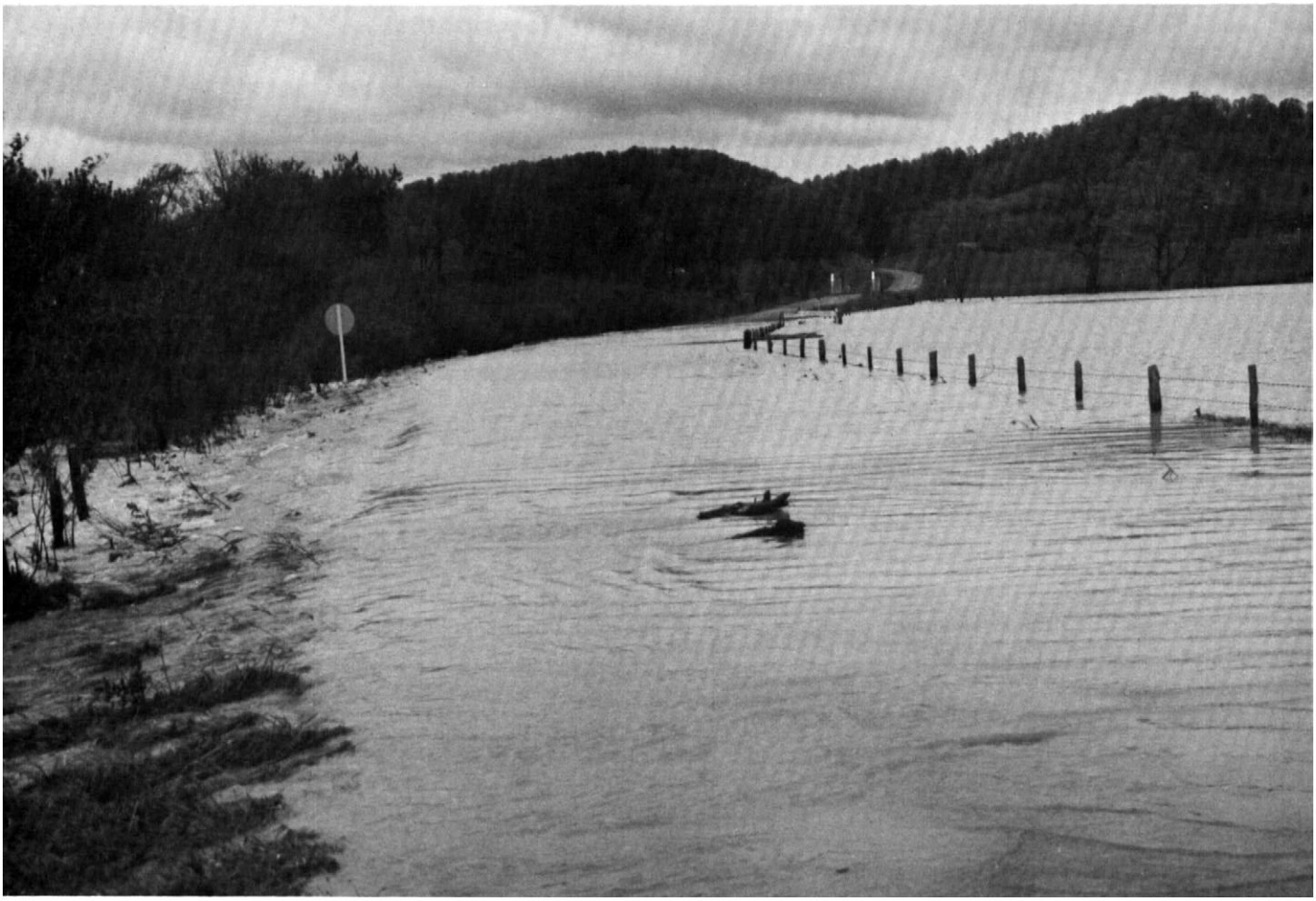


Figure 3. A flooded area of Atkins silt loam along Leading Creek.

Typically the surface layer is brown silt loam about 8 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and channery heavy silty clay loam 30 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 45 inches.

Included with this soil in mapping are small areas of strongly sloping soils, soils that have stones on the surface, soils that are less than 40 inches deep to bedrock, and moderately well drained or somewhat poorly drained soils. Included soils make up about 10 percent of this map unit.

The available water capacity of this Belmont soil is high. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This soil is suited to cultivated crops and to hay and pasture, and it is used mainly for pasture. The hazard of erosion is moderate in unprotected areas and is a major farming management concern. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion control on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is restricted during wet seasons because the soil is soft and slippery.

The limited depth to bedrock, low strength, a moderate shrink-swell potential, and a frost action potential limit this soil for most nonfarm uses. The limestone bedrock

in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

BaC—Belmont silt loam, 8 to 15 percent slopes. This soil is strongly sloping and well drained. It is mostly on benches.

Typically the surface layer is brown silt loam about 8 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and channery heavy silty clay loam 30 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 45 inches.

Included with this soil in mapping are a few small areas of soils that have stones on the surface, severely eroded soils, and soils that are less than 40 inches deep to bedrock. Included soils make up about 10 percent of this map unit.

The available water capacity of this Belmont soil is high. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This soil is suited to cultivated crops and to hay and pasture, and it is used mainly for pasture. The hazard of erosion is severe in unprotected areas and is a major farming management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is restricted during wet seasons because the soil is soft and slippery.

Slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, and a frost action potential limit this soil for most nonfarm uses. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

BaD—Belmont silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is mostly on benches. Drainageways dissect some areas.

Typically the surface layer is brown silt loam about 7 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and channery heavy silty clay loam 28 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 43 inches.

Included with this soil in mapping are small areas of well drained Calvin high base substratum and Meckesville soils. Also included are a few small areas of soils that have stones on the surface, severely eroded soils, soils that are less than 40 inches deep to bedrock, and soils that have slopes of less than 15 percent or more than 25 percent. Included soils make up about 15 percent of this map unit.

The available water capacity of this Belmont soil is high. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This soil is suitable for cultivated crops, but it is better suited to hay and pasture. It is used mainly for pasture. The hazard of erosion is severe in unprotected areas and is a major farming management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are the major pasture management needs.

The soil has moderately high to high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is limited by slope and is restricted during wet seasons because the soil is soft and slippery.

Slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, and a frost action potential limit this soil for most nonfarm uses. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

BaE—Belmont silt loam, 25 to 35 percent slopes. This soil is steep and well drained. It is in areas above and below benches. Drainageways dissect many areas.

Typically the surface layer is brown silt loam about 7 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and channery heavy silty clay loam 26 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 43 inches.

Included with this soil in mapping are a few small areas of well drained Calvin high base substratum soils. Also included are a few small areas of soils with stones on the surface, severely eroded soils, soils that are less than 40 inches deep to bedrock, and very steep soils. Included soils make up about 20 percent of this map unit.

The available water capacity of this Belmont soil is high. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This soil is not suited to cultivated crops or hay, but most areas are suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a major farming management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major managment concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is limited by slope and is restricted during wet seasons because the soil is soft and slippery.

Slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, and a frost action potential limit this soil for most nonfarm uses. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on this soil, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

BbC—Belmont stony silt loam-Rock outcrop complex, 3 to 15 percent slopes. This complex is on benches and ridgetops. It consists of strongly sloping to gently sloping, well drained Belmont soils and areas of exposed limestone bedrock. Stones that are mostly 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soil. The complex is about 70 percent Belmont stony silt loam, 12 percent bedrock exposures, and 18 percent other soils. The Belmont soil and bedrock exposures are so intermingled that it was not practical to map them separately.

Typically the surface layer of the Belmont soil is brown silt loam about 8 inches thick. The subsoil is reddish brown, firm, sticky, silty clay loam and channery heavy silty clay loam 27 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 43 inches.

Included with this unit in mapping are a few small areas of well drained Meckesville soils. Also included are a few small areas of soils that do not have stones on the surface, severely eroded soils, and soils that are less than 40 inches deep to bedrock.

The Belmont soil has high available water capacity. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This complex is not suited to cultivated crops or hay, but most areas are suited to and used for pasture. The stones and bedrock exposures on the surface restrict the use of farm machinery, and a severe erosion hazard is a farming management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The Belmont soil has moderately high potential for trees, but only a small acreage of the complex is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is limited by the exposed rock and is restricted during wet seasons because the soil is soft and slippery.

The main limitations of the complex for most nonfarm uses are slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, a frost action potential, and the stony and rocky surface. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

BbD—Belmont stony silt loam-Rock outcrop complex, 15 to 25 percent slopes. This complex is on benches and ridgetops. It consists of moderately steep, well drained Belmont soils and areas of exposed limestone bedrock. Drainageways dissect some areas. Stones that are mostly 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soil. The complex is about 70 percent Belmont stony silt loam, 12 percent bedrock exposures, and 18 percent other soils. The Belmont soil and exposed bedrock are so intermingled that it was not practical to map them separately.

Typically the surface layer of the Belmont soil is brown silt loam about 8 inches thick. The subsoil is reddish

brown, firm, sticky silty clay loam and channery heavy silty clay loam 27 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 43 inches.

Included with this unit in mapping are a few small areas of well drained Meckesville soils. Also included are a few small areas of soils that do not have stones on the surface, extremely stony soils, severely eroded soils, and soils that are less than 40 inches deep to bedrock.

The Belmont soil has high available water capacity. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This complex is not suited to cultivated crops or hay, but most areas are suited to and used for pasture. The stones and bedrock on the surface restrict the use of farm machinery, and a severe hazard of erosion is a management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The Belmont soil has moderately high to high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope and the rocky and stony surface limit the use of equipment, and its use is further restricted during wet seasons because the soil is soft and slippery.

The main limitations of the complex for most nonfarm uses are slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, a frost action potential, and the stony and rocky surface. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

BbE—Belmont stony silt loam-Rock outcrop complex, 25 to 35 percent slopes. This complex is on side slopes below ridges and between benches. It consists of steep, well drained Belmont soils and areas of exposed limestone bedrock. Drainageways dissect some areas. Stones that are mostly 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soil. The complex is about 60 percent Belmont stony silt loam, 15 percent exposed bedrock, and 25 percent other soils.

Typically the surface layer of the Belmont soil is dark brown silt loam about 8 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and channery heavy silty clay loam 25 inches thick. The substratum is reddish brown channery clay loam that extends to limestone bedrock at a depth of about 43 inches.

Included with this unit in mapping are small areas of well drained Calvin high base substratum and Meckesville soils on narrow benches and side slopes. Also included are a few small areas of soils that do not have stones on the surface, severely eroded soils, soils that are less than 40 inches deep to bedrock, moderately steep soils, and very steep soils.

The Belmont soil has high available water capacity. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This complex is not suited to cultivated crops or hay. It is difficult to manage for pasture, but much of the acreage is pastured.

The Belmont soil has moderately high to high potential for trees, and many areas are wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope and the rocky and stony surface limit the use of equipment. Its use is further restricted during wet seasons because the soil is soft and slippery.

The main limitations of this complex for most nonfarm uses are slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, a frost action potential, and the rocky and stony surface. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

BbF—Belmont stony silt loam-Rock outcrop complex, 35 to 70 percent slopes. This complex is on side slopes. It consists of very steep, well drained Belmont soils and areas of exposed limestone bedrock. Stones that are mostly 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soil. The complex is about 60 percent Belmont stony silt loam, 15 percent exposed bedrock, and 25 percent other soils.

Typically the surface layer of the Belmont soil is dark brown silt loam about 8 inches thick. The subsoil is reddish brown, firm, sticky silty clay loam and heavy silty clay loam 23 inches thick. The substratum is reddish brown clay loam that extends to limestone bedrock at a depth of about 42 inches.

Included with this unit in mapping are a few small areas of well drained Calvin high base substratum, Dekalb, and Meckesville soils. Also included are a few small areas of soils that do not have stones on the

surface, severely eroded soils, soils that are less than 40 inches deep to bedrock, moderately steep soils, and steep soils.

The Belmont soil has high available water capacity. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid to slightly acid in the surface layer and upper part of the subsoil and medium acid to neutral in the lower part of the subsoil. The depth to bedrock ranges from 40 to 50 inches.

This complex is not suited to cultivated crops or hay. It is difficult to manage for pasture, but much of the acreage is pastured.

The Belmont soil has moderately high to high potential for trees, and many areas are wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope and the rocky and stony surface limit the use of equipment. Its use is further restricted during wet seasons because the soil is soft and slippery.

The main limitations of this complex for most nonfarm uses are slope, the limited depth to bedrock, low strength, a moderate shrink-swell potential, a frost action potential, and the rocky and stony surface. The limestone bedrock in some areas is cavernous and allows pollutants from waste disposal systems to enter the ground water. Maintaining the plant cover, establishing a plant cover on unprotected areas, and providing for proper disposal of surface water help to control erosion and sedimentation.

The capability subclass is VIIs.

BeC—Berks channery silt loam, 3 to 15 percent slopes. This soil is strongly sloping or gently sloping and is well drained. It is mostly on ridgetops near the Tygart Valley River and Leading Creek.

Typically the surface layer is dark brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 18 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are small areas of well drained Calvin, Gilpin, and Weikert soils. Also included are a few small areas of severely eroded soils, moderately steep soils, and soils near Spruce Knob Lake that are more than 40 inches deep to bedrock. Included soils make up about 20 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture. Most of the acreage is used for hay and pasture. The hazard of erosion is severe in unprotected areas and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

BeD—Berks channery silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is mostly on ridgetops near the Tygart Valley River and Leading Creek.

Typically the surface layer is dark brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 20 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 32 inches.

Included with this soil in mapping are small areas of well drained Calvin, Gilpin, and Weikert soils. Also included are a few small areas of severely eroded soils, steep soils, and strongly sloping soils. Included soils make up about 20 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is better suited to hay and pasture than to cultivated crops, and much of the acreage is pastured. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderate to moderately high potential for trees, and many areas are wooded. Erosion on logging roads and skid trails is the major management concern,

and placing the roads and trails on the contour helps to control erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

BeE—Berks channery silt loam, 25 to 35 percent slopes. This soil is steep and well drained. It is mostly on side slopes near the Tygart Valley River and Leading Creek.

Typically the surface layer is very dark grayish brown channery silt loam about 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Included with this soil in mapping are small areas of well drained Calvin, Dekalb, and Weikert soils. Also included are a few small areas of severely eroded soils, stony soils, and moderately steep or very steep soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is not suited to cultivated crops or hay, but many areas are suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a major farming management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderate to moderately high potential for trees, and much of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

BeF—Berks channery silt loam, 35 to 70 percent slopes. This soil is very steep and well drained. It is mostly on side slopes near the Tygart Valley River and Leading Creek.

Typically the surface layer is very dark grayish brown channery silt loam 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Included with this soil in mapping are small areas of well drained Calvin and Dekalb soils. Also included are a few small areas of severely eroded soils, stony soils, and soils that have slopes of less than 35 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The soil has moderate to moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope restricts the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

BgC—Berks channery silt loam, moist, 3 to 15 percent slopes. This soil is strongly sloping or gently sloping and is well drained. It is mostly on ridgetops near Middle Mountain and Spruce Knob Lake. The areas are at high elevations where the average annual precipitation exceeds 50 inches.

Typically the surface layer is very dark grayish brown channery silt loam about 5 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 19 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are small areas of well drained Gilpin soils. Also included are a few small areas of severely eroded soils, moderately steep soils, and soils in the Spruce Knob Lake area that are more than 40 inches deep to bedrock. Included soils make up about 20 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture, but the types of suitable crops are limited to those that tolerate a short growing season. The hazard of erosion is severe in unprotected areas and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

BgD—Berks channery silt loam, moist, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is mostly on ridgetops near Middle Mountain and Spruce Knob Lake. The areas are at high elevations where the average annual precipitation exceeds 50 inches.

Typically the surface layer is very dark grayish brown channery silt loam about 4 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 22 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 32 inches.

Included with this soil in mapping are small areas of well drained Gilpin soils. Also included are a few small areas of severely eroded soils, steep soils, and strongly sloping soils. Included soils make up about 20 percent of this map unit.

The available water capacity in this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil has limited suitability for cultivated crops; it is better suited to hay and pasture. The types of suitable crops are limited to those that tolerate a short growing season. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope restricts the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

BgE—Berks channery silt loam, moist, 25 to 35 percent slopes. This soil is steep and well drained. It is mostly on side slopes near Middle Mountain and Spruce Knob Lake. The areas are at high elevations where the average annual precipitation exceeds 50 inches.

Typically the surface layer is very dark grayish brown channery silt loam about 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Included with this soil in mapping are small areas of well drained Calvin, Dekalb, and Weikert soils. Also included are a few small areas of severely eroded soils, stony soils, and moderately steep or very steep soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for cultivated crops or hay, but the soil is suited to pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

This soil has high potential for trees, and most of the acreage is wooded. Erosion in logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope restricts the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

BgF—Berks channery silt loam, moist, 35 to 70 percent slopes. This soil is very steep and well drained.

It is mostly on side slopes near Middle Mountain and Spruce Knob Lake. The areas are at high elevations where the average annual precipitation exceeds 50 inches.

Typically the surface layer is very dark grayish brown channery silt loam 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Included with this soil in mapping are small areas of well drained Calvin and Dekalb soils. Also included are a few small areas of severely eroded soils, stony soils, and soils that have slopes of less than 35 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of this Berks soil is very low to moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. Most areas are wooded. The soil has high potential for trees. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. Slope restricts the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

BkC—Berks-Weikert complex, 8 to 15 percent slopes. This complex consists of strongly sloping, well drained soils that are mostly on ridgetops near the Tygart Valley River and Leading Creek. The soils in this complex are so intermingled that it was not practical to map them separately. The complex is about 45 percent Berks channery silt loam, 40 percent Weikert shaly silt loam, and 15 percent other soils.

Typically the surface layer of the Berks soil is dark brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 18 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Typically the surface layer of the Weikert soil is dark brown shaly silt loam about 6 inches thick. The subsoil is brown, friable very shaly heavy silt loam 6 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 14 inches.

Included with these soils in mapping are small areas of well drained Gilpin soils. Also included are a few small areas of soils in which bedrock is at a depth of more than 40 inches, soils that do not have stone fragments in the surface layer or subsoil, soils that have a few cobbles, and severely eroded soils.

Available water capacity is very low to moderate in the Berks soil and very low in the Weikert soil. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is rapid on both soils, and natural fertility is low. Where unlimed, the Berks soil is strongly acid or very strongly acid throughout, and the Weikert soil is medium acid to very strongly acid throughout. The root zone of some types of plants is restricted by bedrock, which is at a depth of 10 to 40 inches in this complex.

The soils in this complex have limited suitability for cultivated crops. Most areas are better suited to and used for hay and pasture. A severe erosion hazard on unprotected areas and droughtiness are the main farming management concerns. If the soils are cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, sodding shallow drainageways, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and seeding of bare areas are the main pasture management needs.

The soils have moderate potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is the main management concern, and placing the roads and trails on the contour helps to control erosion.

Slope and the limited depth to bedrock are the main limitations of this complex for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

BkD—Berks-Weikert complex, 15 to 25 percent slopes. This complex consists of moderately steep, well drained soils on ridgetops and side slopes near the Tygart Valley River and Leading Creek. The soils are so intermingled that it was not practical to map them separately. The complex is about 45 percent Berks channery silt loam, 40 percent Weikert shaly silt loam, and 15 percent other soils.

Typically the surface layer of the Berks soil is dark brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 20 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 32 inches.

Typically the surface layer of the Weikert soil is dark brown shaly silt loam about 6 inches thick. The subsoil is brown, friable very shaly heavy silt loam 6 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 16 inches.

Included with these soils in mapping are small areas of well drained Gilpin soils. Also included are a few small areas of soils in which bedrock is at a depth of more than 40 inches, soils with slopes of more than 25 percent, and severely eroded soils.

Available water capacity is very low to moderate in the Berks soil and very low in the Weikert soil. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is rapid on both soils, and natural fertility is low. Where unlimed, the Berks soil is strongly or very strongly acid throughout, and the Weikert soil is medium acid to very strongly acid throughout. The root zone of some types of plants is restricted by bedrock, which is at a depth of 10 to 40 inches in this complex.

The soils in this complex are unsuitable for cultivated crops or hay. Many areas are suited to and used for pasture. A severe erosion hazard on unprotected areas and droughtiness are the main farming management concerns. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and seeding of bare areas are the main pasture management needs.

The soils have low to moderate potential for trees. About half of the acreage is wooded. Erosion on logging roads and skid trails is the main management concern, and placing the roads and trails on the contour helps to control erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this complex for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

BkE—Berks-Weikert complex, 25 to 35 percent slopes. This complex consists of steep, well drained soils mostly on side slopes and narrow ridgetops near the Tygart Valley River and Leading Creek. The soils are so intermingled that it was not practical to map them separately. The complex is about 45 percent Berks channery silt loam, 40 percent Weikert shaly silt loam, and 15 percent other soils.

Typically the surface layer of the Berks soil is very dark grayish brown channery silt loam about 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Typically the surface layer of the Weikert soil is dark brown shaly silt loam about 3 inches thick. The subsoil is brown, friable very shaly heavy silt loam 8 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 18 inches.

Included with these soils in mapping are small areas of well drained Gilpin soils. Also included are a few small areas of soils in which bedrock is at a depth of more than 40 inches, moderately steep or very steep soils, and severely eroded soils.

Available water capacity is very low to moderate in the Berks soil and very low in the Weikert soil. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils, and natural fertility is low. Where unlimed, the Berks soil is strongly acid or very strongly acid throughout, and the Weikert soil is medium acid to very strongly acid throughout. The root zone of some plants is restricted by bedrock, which is at a depth of 10 to 40 inches in this complex.

Slope makes the soils in this complex generally unsuitable for farming. Most areas are used for woodland. The soils have low to moderate potential for trees. Erosion on logging roads and skid trails is the main management concern, and placing the roads and trails on the contour helps to control erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this complex for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

BkF—Berks-Weikert complex, 35 to 70 percent slopes. This complex consists of very steep, well drained soils mainly on side slopes and narrow ridgetops near the Tygart Valley River and Leading Creek. The soils are so intermingled that it was not practical to map them separately. The complex is about 60 percent Berks channery silt loam, 30 percent Weikert shaly silt loam, and 10 percent other soils.

Typically the surface layer of the Berks soil is very dark grayish brown channery silt loam about 3 inches thick. The subsoil is yellowish brown, friable and firm channery silt loam 24 inches thick. The substratum is yellowish brown very channery silt loam that extends to bedrock at a depth of about 35 inches.

Typically the surface layer of the Weikert soil is dark brown shaly silt loam about 3 inches thick. The subsoil is brown, friable very shaly heavy silt loam 8 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 18 inches.

Included with these soils in mapping are small areas of well drained Gilpin soils. Also included are a few areas of soils in which bedrock is at a depth of more than 40 inches, soils with slopes of less than 35 percent, and severely eroded soils.

Available water capacity is very low to moderate in the Berks soil and very low in the Weikert soil. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils, and natural fertility is low. Where unlimed, the Berks soil is strongly acid or very strongly acid throughout, and the Weikert soil is medium acid to very

strongly acid throughout. The root zone of some types of plants is restricted by bedrock, which is at a depth of 10 to 40 inches in this complex.

Slope makes the soils in this complex generally unsuitable for farming. Most areas are used for woodland. The soils have low to moderate potential for trees. Erosion on logging roads and skid trails is the main management concern, and placing the roads and trails on the contour helps to control erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this complex for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

Bo—Blago silty clay loam. This soil is nearly level and very poorly drained or poorly drained. It is on low terraces mainly along the Tygart Valley River.

Typically the surface layer is black silty clay loam about 16 inches thick and is mottled in the lower part with dark gray and brown. The subsoil is 35 inches thick. It is friable and firm, sticky, gray silty clay with brown mottles. The substratum extends to a depth of 60 inches or more. It is dark reddish brown heavy clay loam mottled with gray.

Included with this soil in mapping are a few small areas of somewhat poorly drained Tygart and Tygart Variant soils and poorly drained or very poorly drained Purdy soils. Also included are a few small areas of moderately coarse textured soils and soils that are subject to flooding. Included soils make up about 20 percent of this map unit.

The available water capacity of this Blago soil is high. Permeability is slow in the subsoil. Runoff is very slow, and some areas have water ponded on the surface. Natural fertility is low to moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. This soil has a seasonal high water table at or near the surface which restricts the root zone of many types of plants. The depth to bedrock is greater than 60 inches.

This soil has limited suitability for cultivated crops. It is better suited to hay or pasture plants that tolerate wetness, and most of the acreage is used for hay and pasture. Providing drainage is the main management concern, but some areas lack suitable drainage outlets. In places, diversions help to intercept runoff from higher areas. If this soil is cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to increase fertility and tilth. The use of proper stocking rates, the use of rotational grazing, and deferment of grazing until the soil is firm are the major pasture management needs.

The soil has very high potential for trees that tolerate wetness, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, the slow permeability, low strength, and a frost action potential are the main limitations of this soil for nonfarm use. Flooding is an additional limitation in some low areas. Establishing a plant cover on unprotected areas and providing proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVw.

BrB—Brinkerton Variant silt loam, 3 to 8 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on foot slopes, around stream heads, and in saddles and depressions on uplands. The areas are scattered throughout the survey area, but most are at an elevation of more than 3,000 feet.

Typically the surface layer is black and brown silt loam mottled with gray and is about 7 inches thick. The subsoil is 35 inches thick. It is brown, firm silty clay loam mottled with gray, and the lower 15 inches is brittle. The substratum is brown and gray shaly silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Ernest soils. Also included are a few small areas of stony soils, soils that do not have a brittle layer in the subsoil, soils that are less than 40 inches deep to bedrock, poorly drained and very poorly drained soils, and nearly level or strongly sloping soils. A few areas of soils along drainageways in the Spruce Knob Lake area are very shaly. Included soils make up about 40 percent of this map unit.

The available water capacity of this Brinkerton soil is moderate. Permeability is slow in the brittle part of the subsoil and in the substratum. Runoff is medium, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The soil has a seasonal high water table about 1/2 foot to 1-1/2 feet below the surface which restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

This soil has limited suitability for cultivated crops. It is better suited to hay or pasture plants that tolerate wetness. Providing drainage is a major concern for crops, hay, or pasture. In some areas diversions help to intercept runoff from higher areas. The hazard of erosion is moderate in unprotected areas. If this soil is cultivated, cultivating on the contour, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is firm are major pasture management needs.

This soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern, and placing the

roads and trails on the contour helps to control erosion. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, the slow permeability, low strength, and a frost action potential limit this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVw.

BsC—Brinkerton Variant very stony silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and somewhat poorly drained. It is mostly around stream heads, along drainageways, and in saddles and depressions on uplands. Most areas are at an elevation of more than 3,000 feet. Stones cover 3 to 15 percent of the surface.

Typically the surface layer is black and brown silt loam mottled with gray and is about 7 inches thick. The subsoil is 35 inches thick. It is brown, firm silty clay loam mottled with gray, and the lower 15 inches is brittle. The substratum is brown and gray shaly silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Ernest soils. Also included are a few small areas of extremely stony soils, soils that do not have a brittle layer in the subsoil, soils that are less than 40 inches deep to bedrock, poorly drained and very poorly drained soils, coarse textured soils, and nearly level to moderately steep soils. Included soils make up about 45 percent of this map unit.

The available water capacity of this Brinkerton soil is moderate. Permeability is slow in the brittle part of the subsoil and in the substratum. Runoff is medium to rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The soil has a seasonal high water table about 1/2 foot to 1-1/2 feet below the surface which restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

The stones on the surface restrict the use of farm machinery and generally make the soil poorly suited to farming. Most areas are used for woodland. The soil has a high potential for trees. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control erosion. The stones on the surface limit the use of equipment. Its use is further limited during wet seasons because the soil is soft.

The seasonal high water table, the slow permeability, low strength, a frost action potential, and the stony surface limit this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

BtC—Buchanan and Ernest stony soils, 3 to 15 percent slopes. This unit consists of gently sloping to strongly sloping, moderately well drained soils on foot slopes and around stream heads mostly in the southern and western parts of the survey area. Stones cover 1 to 3 percent of the surface of the areas. The total acreage of this unit is about 45 percent Buchanan soils, 35 percent Ernest soils, and 20 percent other soils. Some areas consist entirely of Buchanan soils, some of Ernest soils, and some of both. The soils were mapped together because they have no major differences in use and management.

Typically the surface layer of the Buchanan soils is very dark gray loam about 1 inch thick underlain by 4 inches of brown loam. The subsoil is 55 inches thick. The upper 12 inches is brown and yellowish brown, friable loam. The next 9 inches is light yellowish brown, friable channery light clay loam mottled with strong brown and light gray. The lower 34 inches is firm and brittle, light yellowish brown channery sandy clay loam mottled with strong brown and light gray. The substratum, at a depth of more than 60 inches, is light yellowish brown very channery sandy loam mottled with light gray.

Typically the surface layer of the Ernest soil is very dark grayish brown and brown silt loam about 5 inches thick. The subsoil is 49 inches thick. The upper 4 inches is yellowish brown, friable silt loam. The next 17 inches is pale brown, firm channery silty clay loam mottled with yellowish brown and light brownish gray. The lower 28 inches is firm and brittle, yellowish brown and brown channery silt loam mottled with yellowish brown and light brownish gray. The substratum is brown channery silt loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of well drained Dekalb and Gilpin soils and somewhat poorly drained Brinkerton Variant soils. Also included are a few small areas of other well drained soils, soils that have no stones on the surface, and soils where stones cover more than 3 percent of the surface.

These Buchanan and Ernest soils have moderate available water capacity. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is medium or rapid, and natural fertility is moderate. Where unlimed, the soils are strongly acid or very strongly acid throughout. These soils have a seasonal high water table about 1-1/2 to 3 feet below the surface which restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches in both soils.

The stones on the surface restrict the use of farm machinery and generally make these soils poorly suited to cultivated crops and hay. Some of the acreage is suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

These soils have high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control erosion. The use of equipment is restricted during wet seasons because these soils are soft.

The stones on the surface, slope, the moderately slow or slow permeability, and the seasonal high water table limit these soils for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

BtE—Buchanan and Ernest stony soils, 15 to 35 percent slopes. This unit consists of moderately steep to steep, moderately well drained soils on foot slopes and around stream heads mostly in the southern and western parts of the survey area. Stones cover 1 to 3 percent of the surface of the areas. The total acreage of this unit is about 50 percent Buchanan soils, 30 percent Ernest soils, and 20 percent other soils. Some areas consist entirely of Buchanan soils, some of Ernest soils, and some of both. The soils were mapped together because they have no major differences in use and management.

Typically the surface layer of the Buchanan soils is very dark gray loam about 1 inch thick underlain by 4 inches of brown loam. The subsoil is 55 inches thick. The upper 12 inches of the subsoil is brown and yellowish brown, friable loam. The next 9 inches is light yellowish brown, friable channery light clay loam mottled with strong brown and light gray. The lower 34 inches is firm and brittle, light yellowish brown channery sandy clay loam mottled with strong brown and light gray. The substratum, at a depth of more than 60 inches, is firm, light yellowish brown sandy loam mottled with light gray.

Typically the surface layer of the Ernest soils is very dark grayish brown and brown silt loam about 5 inches thick. The subsoil is 49 inches thick. The upper 4 inches is yellowish brown, friable silt loam. The next 17 inches is pale brown, firm channery silty clay loam mottled with yellowish brown and light brownish gray. The lower 28 inches is firm and brittle, yellowish brown and brown channery silt loam mottled with yellowish brown and light brownish gray. The substratum is brown channery silt loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of well drained Dekalb and Gilpin soils and somewhat poorly drained Brinkerton Variant soils. Also included are a few small areas of other well drained soils, soils that have no stones on the surface, soils where stones cover more than 3 percent of the surface, and soils that have a brittle layer at a depth of more than 40 inches.

These Buchanan and Ernest soils have moderate available water capacity. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is rapid or very rapid, and natural fertility is moderate. Where unlimed, the soils are strongly acid or very strongly acid throughout. These soils have a seasonal high water table about 1-1/2 to 3 feet below the surface which restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches in both soils.

Slope and the stones on the surface make these soils generally unsuitable for farming. Most of the acreage is wooded, and the soils have high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope and the stones on the surface limit the use of equipment, and its use is further limited during wet seasons because the soil is soft.

The stony surface, slope, moderately slow or slow permeability, and the seasonal high water table limit these soils for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

CaC—Calvin channery silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. The areas are mostly on ridgetops.

Typically the surface layer is reddish brown channery silt loam about 7 inches thick. The subsoil is reddish brown channery loam 20 inches thick. The upper part is firm, and the lower part is friable. The substratum is reddish brown very channery loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of well drained Berks and Dekalb soils. Also included are a few small areas of severely eroded soils and moderately steep soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is low to moderate. Permeability is moderately rapid. Runoff is medium or rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suitable for cultivated crops and hay and pasture. Much of the acreage is used for hay and pasture. The hazard of erosion is moderate or severe in unprotected areas and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees. Erosion on logging roads and skid trails is a

management concern, and placing the roads and trails on the contour helps to control erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

CaD—Calvin channery silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on ridgetops.

Typically the surface layer is reddish brown channery silt loam about 6 inches thick. The subsoil is reddish brown channery loam 20 inches thick. The upper part is firm, and the lower part is friable. The substratum is reddish brown very channery loam that extends to bedrock at a depth of 32 inches.

Included with this soil in mapping are a few small areas of well drained Berks and Dekalb soils, severely eroded soils, and steep soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is low to moderate, and permeability is moderately rapid. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope limits the suitability of this soil for cultivated crops. Most areas are suited to and used for hay or pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has moderately high to high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

CaE—Calvin channery silt loam, 25 to 35 percent slopes. This soil is steep and well drained. Most areas are on side slopes.

Typically the surface layer is dark reddish brown channery silt loam about 1 inch thick underlain by dark reddish gray channery loam about 7 inches thick. The subsoil is reddish brown channery loam 19 inches thick. The upper part is firm, and the lower part is friable. The substratum is reddish brown very channery loam that extends to bedrock at a depth of 34 inches.

Included with this soil in mapping are a few small areas of well drained Berks and Dekalb soils. Also included are a few areas of exposed bedrock and severely eroded soils. Included areas make up about 20 percent of this map unit.

The available water capacity of this Calvin soil is low to moderate. Permeability is moderately rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope limits the suitability of this soil for cultivated crops and hay, but the soil is suitable for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

CaF—Calvin channery silt loam, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes.

Typically the surface layer is dark reddish brown channery silt loam about 1 inch thick underlain by dark reddish gray channery loam about 7 inches thick. The subsoil is reddish brown channery loam 19 inches thick. The upper part is firm, and the lower part is friable. The substratum is reddish brown very channery loam that extends to bedrock at a depth of 34 inches.

Included with this soil in mapping are a few small areas of well drained Berks and Dekalb soils. Also included are a few small areas of severely eroded soils, stony soils, and exposed bedrock.

The available water capacity of this Calvin soil is low to moderate. Permeability is moderately rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. Most areas are wooded. The soil has moderately high to

high potential for trees. A severe erosion hazard on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

CbB—Calvin silt loam, high base substratum, 3 to 8 percent slopes. This soil is gently sloping and well drained. Most areas are on ridgetops.

Typically the surface layer is brown silt loam about 6 inches thick. The subsoil is 22 inches thick. The upper 4 inches is friable, reddish brown heavy silt loam, and the lower 18 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of soils that are more than 40 inches deep to bedrock, severely eroded soils, poorly drained soils, soils with fewer stone fragments, and soils that are very strongly acid in the lower part. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is medium, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suitable for cultivated crops and hay and pasture. Most areas are used for pasture. The hazard of erosion is moderate in unprotected areas and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is limited during wet seasons because the soil is soft.

The limited depth to bedrock and low strength limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

CbC—Calvin silt loam, high base substratum, 8 to 15 percent slopes. This soil is strongly sloping and well drained. Most areas are on ridgetops, but some are on benches.

Typically the surface layer is brown silt loam about 6 inches thick. The subsoil is 22 inches thick. The upper 4 inches is friable, reddish brown heavy silt loam, and the lower 18 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of soils that are more than 40 inches deep to bedrock, severely eroded soils, poorly drained soils, soils with fewer stone fragments, and soils that are very strongly acid in the lower part. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is rapid, and natural fertility is moderate or high. Where unlimed, this soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suitable for cultivated crops and hay and pasture. Most areas are used for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

Low strength and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

CbD—Calvin silt loam, high base substratum, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on benches, but some are on ridgetops.

Typically the surface layer is brown silt loam about 5 inches thick. The subsoil is 23 inches thick. The upper 3 inches is friable, reddish brown heavy silt loam, and the lower 20 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb soils. Also included are a few small areas along drainageways of soils that are deeper than 40 inches to bedrock, soils with fewer stone fragments, severely eroded soils, stony soils, and soils that are very strongly acid in the lower part. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope limits the suitability of this soil for cultivated crops. The areas are better suited to hay or pasture, and most are used for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has moderately high to high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

CbE—Calvin silt loam, high base substratum, 25 to 35 percent slopes. This soil is steep and well drained. Most areas are on side slopes.

Typically the surface layer is dark brown silt loam about 3 inches thick. The subsoil is 25 inches thick. The upper 4 inches is friable, dark reddish gray silt loam, and the lower 21 inches is friable, reddish brown and channery light silty clay loam. The substratum is reddish brown very channery heavy silt loam that extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of soils that are deeper than 40 inches to bedrock, soils with fewer stone fragments, severely eroded soils, stony soils, soils that are very strongly acid in the lower part, and areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for cultivated crops or hay, but much of the acreage is suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has moderately high to high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

CbF—Calvin silt loam, high base substratum, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes, and most are dissected by drainageways.

Typically the surface layer is dark brown silt loam about 3 inches thick. The subsoil is 25 inches thick. The upper 3 inches is friable, dark reddish gray silt loam, and the lower 22 inches is friable, reddish brown and channery light silty clay loam. The substratum is reddish brown very channery heavy silt loam that extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of soils that are deeper than 40 inches to bedrock, soils with fewer stone fragments, severely eroded soils, stony soils, soils that are very strongly acid in the lower part, and areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. Most areas are wooded. The soil has moderately high to high potential for trees. Erosion on logging roads and

skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further limited during wet seasons because the soil is soft.

Slope, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

CcC—Calvin stony silt loam, high base substratum, 3 to 15 percent slopes. This soil is strongly sloping or gently sloping and is well drained. The areas are on ridgetops and benches, and stones cover 1 to 3 percent of the surface.

Typically the surface layer is dark brown channery silt loam about 5 inches thick. The subsoil is 23 inches thick. The upper 3 inches is friable, reddish brown channery heavy silt loam, and the lower 20 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of severely eroded soils, soils with fewer stone fragments, soils that are very strongly acid in the lower part, soils with no stones on the surface, and soils where stones cover more than 3 percent of the surface. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is medium or rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

The stones on the surface restrict the use of farm machinery and make the soil generally unsuitable for cultivated crops or hay. Much of the acreage is suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates and the use of rotational grazing are major pasture management concerns.

The soil has high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

The stones on the surface, low strength, slope, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

CcD—Calvin stony silt loam, high base substratum, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on benches. Stones cover 1 to 3 percent of the surface of the areas.

Typically the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is 25 inches thick. The upper 4 inches is friable, reddish brown channery heavy silt loam, and the lower 21 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of severely eroded soils, soils with fewer stone fragments, soils that are very strongly acid in the lower part, soils that have no stones on the surface, and soils where stones cover more than 3 percent of the surface. Included soils make up about 15 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for cultivated crops or hay. Much of the acreage is suited to and used for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope, the stones on the surface, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

CcE—Calvin stony silt loam, high base substratum, 25 to 35 percent slopes. This soil is steep and well

drained. The areas are on side slopes, and stones cover 1 to 3 percent of the surface.

Typically the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is 25 inches thick. The upper 3 inches is friable, reddish brown channery heavy silt loam, and the lower 22 inches is friable, reddish brown channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of severely eroded soils, soils with fewer stone fragments, soils that are very strongly acid in the lower part, soils that do not have stones on the surface, soils where stones cover more than 3 percent of the surface, and areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded. The soil has moderately high to high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope, the stones on the surface, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper suface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

CcF—Calvin stony silt loam, high base substratum, 35 to 70 percent slopes. This soil is very steep and well drained. The areas are on side slopes, and stones cover 1 to 3 percent of the surface.

Typically the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is 25 inches thick. The upper 3 inches is friable, reddish brown channery heavy silt loam, and the lower 22 inches is reddish brown, friable channery silty clay loam. The substratum is reddish brown very channery silt loam that extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb and Meckesville soils. Also included are a few small areas of severely eroded soils, soils with fewer stone fragments, soils that are very strongly acid in the lower part, soils that do not have stones on the surface, soils where stones cover more than 3 percent of the surface, and areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Calvin soil is moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate or high. Where unlimed, the soil is very strongly acid to medium acid in the surface layer and upper part of the subsoil and strongly acid to slightly acid in the lower part of the subsoil and in the substratum. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded. The soil has moderately high to high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope, the stones on the surface, low strength, and the limited depth to bedrock limit this soil for most nonfarm uses. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

Ch—Chavies fine sandy loam. This soil is nearly level and well drained. It is on high flood plains along the Middle Fork River and its tributaries, and the areas are subject to rare flooding.

Typically the surface layer is dark brown fine sandy loam about 9 inches thick. The subsoil is strong brown, friable fine sandy loam 41 inches thick. The substratum is strong brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Pope soils, moderately well drained Philo soils, and poorly drained Atkins soils. Also included are a few small areas of gravelly soils. Included soils make up about 30 percent of this map unit.

The available water capacity of this Chavies soil is moderate or high. Permeability is moderately rapid. Runoff is medium, and natural fertility is moderate. Where unlimed, the soil is medium acid to very strongly acid throughout. The depth to bedrock is greater than 60 inches.

This soil is suitable for cultivated crops and hay and pasture. Much of the acreage is used for cultivated crops and hay. Crops can be grown continuously, but the soil needs the protection of a cover crop. Working the residue from the cover crop into the soil helps to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has a high potential for trees. About half of the acreage is wooded.

The hazard of flooding is the main limitation of this soil for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIs.

CoB—Cookport Variant silt loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. The areas are mainly on broad ridgetops, but some are on broad benches. Most areas are at an elevation of more than 3,000 feet.

Typically the surface layer is black silt loam about 3 inches thick underlain by 5 inches of brown loam. The subsoil is 22 inches thick. The upper 10 inches is yellowish brown, friable loam and clay loam mottled with strong brown and reddish gray. The lower 12 inches is firm and dense, brown clay loam mottled with strong brown and olive gray. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Dekalb, Gilpin, and Lily soils and somewhat poorly drained Brinkerton Variant soils. Also included are a few small areas of stony soils, soils that have a very firm and brittle layer in the subsoil, and nearly level or strongly sloping soils. Included soils make up about 40 percent of this map unit.

The available water capacity of this Cookport soil is moderate. Permeability is moderate in the surface layer and upper part of the subsoil and moderately slow in the lower part of the subsoil. Runoff is medium, and natural fertility is low or moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 2-1/2 feet below the surface and the bedrock at a depth of 20 to 40 inches restrict the root zone of some types of plants.

This soil is suited to farming. The hazard of erosion is moderate in unprotected areas and is a management concern. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is firm are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because this soil is soft.

The seasonal high water table, limited depth to bedrock, moderately slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

CsC—Cookport Variant very stony silt loam, 3 to 15 percent slopes. This soil is strongly sloping or gently sloping and moderately well drained. It is mainly on broad ridgetops, but some areas are on benches. The areas are mostly at an elevation of more than 3,000 feet, and stones cover 3 to 15 percent of the surface.

Typically the surface layer is black silt loam about 3 inches thick underlain by 5 inches of brown loam. The subsoil is 22 inches thick. The upper 10 inches is yellowish brown, friable loam and clay loam mottled with strong brown and reddish gray. The lower 12 inches is firm and dense, brown clay loam mottled with strong brown and olive gray. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Dekalb, Gilpin, and Lily soils; somewhat poorly drained Brinkerton Variant soils; soils that have a subsoil of silty clay loam or silty clay; and soils that have no stones on the surface or where stones cover more than 15 percent of the surface. Also included are small areas of soils that consist of sandy loam, soils that have a very firm and brittle layer in the subsoil, and nearly level or moderately steep soils. Included soils make up about 40 percent of this map unit.

The available water capacity of this Cookport soil is moderate. Permeability is moderate in the surface layer and upper part of the subsoil and moderately slow in the lower part of the subsoil. Runoff is medium or rapid, and natural fertility is low or moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 2-1/2 feet below the surface and the bedrock at a depth of 20 to 40 inches restrict the root zone of some types of plants.

The stones on the surface restrict the use of farm machinery and make the soil generally unsuitable for farming. Most of the acreage is wooded. The soil has high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is limited during wet seasons because the soil is soft.

Slope, the seasonal high water table, the limited depth to bedrock, moderately slow permeability, a frost action potential, and the stones on the surface are the main limitations of the soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DaB—Dekalb channery loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. Most areas are on ridgetops at an elevation of more than 3,000 feet.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown,

friable channery loam 19 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is medium, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture. The hazard of erosion is moderate in unprotected areas and is a major management concern. If this soil is cultivated, using contour farming and a crop sequence that includes hay and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

The limited depth to bedrock is the main limitation of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

DaC—Dekalb channery loam, 8 to 15 percent slopes. This soil is strongly sloping and well drained. Most areas are on ridgetops and benches at an elevation of more than 3,000 feet.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 19 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using contour farming and a crop sequence that includes hay and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

DaD—Dekalb channery loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on ridgetops and side slopes. Drainageways dissect some areas.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 15 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Buchanan, Ernest, and Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 20 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil has limited suitability for cultivated crops; it is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable

grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

DaE—Dekalb channery loam, 25 to 35 percent slopes. This soil is steep and well drained. The areas are mostly on side slopes near benches and strip mines, and most areas are dissected by drainageways.

Typically the surface layer is brown channery loam about 7 inches thick. The subsoil is yellowish brown, friable channery loam 17 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Calvin soils; moderately well drained Buchanan and Ernest soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for cultivated crops and hay. The soil is difficult to manage for pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

DaF—Dekalb channery loam, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes near benches and strip mines, and most are dissected by drainageways.

Typically the surface layer is brown channery loam about 7 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Gilpin and Calvin soils, moderately well drained Buchanan and Ernest soils, soils that are less than 20 inches deep to bedrock, and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

DbB—Dekalb channery loam, moist, 3 to 8 percent slopes. This soil is gently sloping and well drained. It is mostly on ridgetops at an elevation where the average annual precipitation exceeds 50 inches.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is medium, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly

acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture, but the types of suitable crops are limited to those that tolerate a short growing season. The hazard of erosion is moderate in unprotected areas and is a major management concern. If this soil is cultivated, using contour farming and a crop sequence that includes hay and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

The limited depth to bedrock is the main limitation of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

DbC—Dekalb channery loam, moist, 8 to 15 percent slopes. This soil is strongly sloping and well drained. It is mostly on ridgetops and benches at an elevation where the average annual precipitation exceeds 50 inches.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture, but the types of suitable crops are limited to those that tolerate a short growing season. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using contour farming and a crop sequence that includes hay and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

DbD—Dekalb channery loam, moist, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on ridgetops and side slopes at an elevation where the average annual precipitation exceeds 50 inches. Drainageways dissect some areas.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 15 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Lily soils; moderately well drained Buchanan, Ernest, and Cookport Variant soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few soils with fewer stone fragments and stony soils. Included soils make up about 20 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope limits the use of this soil for cultivated crops; the soil is better suited to hay and pasture. The types of suitable crops are limited to those that tolerate a short growing season. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage and contour farming, using a crop sequence that includes hay, sodding drainageways, and returning crop residue to the soil help to control erosion and increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant

cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

DbE—Dekalb channery loam, moist, 25 to 35 percent slopes. This soil is steep and well drained. Most areas are on side slopes near benches and strip mines and at an elevation where the average annual precipitation exceeds 50 inches.

Typically the surface layer is brown channery loam about 7 inches thick. The subsoil is yellowish brown, friable channery loam 17 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Gilpin, and Calvin soils; moderately well drained Buchanan and Ernest soils; soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of soils with fewer stone fragments and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for crops and hay and poorly suited to pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover at construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

DbF—Dekalb channery loam, moist, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes near benches and strip mines, and most are dissected by drainageways. The areas are at an elevation where the average annual precipitation exceeds 50 inches.

Typically the surface layer is brown channery loam about 7 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown channery loam that extends to bedrock at a depth of 33 inches.

Included with this soil in mapping are a few small areas of well drained Gilpin and Calvin soils, moderately well drained Buchanan and Ernest soils, soils that are less than 20 inches deep to bedrock; and soils that are more than 40 inches deep to bedrock. Also included are a few small areas of finer textured soils and stony soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Runoff is rapid, and natural fertility is low. Permeability is moderately rapid or rapid. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. The soil has high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

DmC—Dekalb extremely stony loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. The areas are mostly on ridgetops and benches, and stones cover 15 to 40 percent of the surface.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 33 inches.

Included with this soil in mapping are small areas of well drained Calvin and Gilpin soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have more stones or fewer stones on the surface than this Dekalb soil and a few areas of moderately steep soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

The stones on the surface make this soil generally unsuitable for farming. The soil has moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DmE—Dekalb extremely stony loam, 15 to 35 percent slopes. This soil is steep or moderately steep and is well drained. Most areas are on side slopes, and stones cover 15 to 40 percent of the surface.

Typically the surface layer is brown channery loam about 8 inches thick. The subsoil is yellowish brown friable, channery loam about 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with this soil in mapping are a few small areas of well drained Calvin, Calvin high base substratum, and Gilpin soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have fewer stones or more stones on the surface than this Dekalb soil and small areas of reddish sandy loam. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is rapid or very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most of the acreage is wooded, and the soil has moderately high to high potential for trees, but the slope and stones also limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DmF—Dekalb extremely stony loam, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes. Stones cover 15 to 40 percent of the surface of the soil.

Typically the surface layer is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with this soil in mapping are a few small areas of well drained Berks, Calvin, Calvin high base substratum, and Gilpin soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have fewer stones or more stones on the surface than this Dekalb soil, soils that have slopes of less than 35 percent, and small areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, and the soil has moderately high to high potential for trees, but the slope and stones also limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DrC—Dekalb extremely stony loam, moist, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. Most areas are on ridgetops and benches at an elevation where the average annual precipitation exceeds 50 inches. Stones cover 15 to 40 percent of the surface.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 33 inches.

Included with this soil in mapping are small areas of well drained Gilpin soils and moderately well drained Buchanan, Cookport Variant, and Ernest soils. Also included are a few small areas of soils that have fewer stones or more stones on the surface than this Dekalb soil and a few areas of moderately steep soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

The stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, and the soil has high potential for trees, but the stones also limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and

placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DrE—Dekalb extremely stony loam, moist, 15 to 35 percent slopes. This soil is steep or moderately steep and is well drained. Most areas are on side slopes at an elevation where the average annual precipitation exceeds 50 inches. Stones cover 15 to 40 percent of the surface.

Typically the surface layer is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with this soil in mapping are a few small areas of well drained Gilpin soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have fewer stones or more stones on the surface than this Dekalb soil and small areas of reddish sandy loam. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is rapid or very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, and the soil has high potential for trees, but the slope and stones also limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DrF—Dekalb extremely stony loam, moist, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes at an elevation where the average annual precipitation exceeds 50 inches. Stones cover 15 to 40 percent of the surface of the soil.

Typically the surface layer is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with this soil in mapping are a few small areas of well drained Gilpin soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have fewer stones or more stones on the surface than this Dekalb soil, areas of soils with slopes of less than 35 percent, and small areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, and the soil has high potential for trees, but the slope and stones also limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DsD—Dekalb rubbly loam, 3 to 25 percent slopes. This soil is gently sloping to moderately steep and is well drained. Most areas are on ridgetops near Cheat Mountain, Shavers Mountain, and Dolly Sods at an elevation of more than 3,000 feet. Stones and boulders 1 to 6 feet in diameter cover 50 to 90 percent of the surface of the soil.

Typically the surface layer is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam or channery sandy loam 14 inches thick. The substratum is yellowish brown very channery loam or very channery sandy loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of well drained Calvin soils, moderately well drained Ernest soils, soils that are less than 20 inches deep to bedrock, and soils that are more than 40 inches deep to bedrock. Also included are small areas of soils that are not as well drained as this Dekalb soil, soils that do not have stones on the surface, and soils where stones cover more than 90 percent of the surface. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is medium or rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very

strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, but the soil has low potential for trees and the slope and stones limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

DsF—Dekalb rubbly loam, 25 to 80 percent slopes. This soil is steep to very steep and is well drained. Most areas are on side slopes near Cheat Mountain, Shavers Mountain, and Dolly Sods at an elevation of more than 3,000 feet. Stones and boulders 1 to 6 feet in diameter cover 50 to 90 percent of the surface of the soil.

Typically the surface layer is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam or channery sandy loam 14 inches thick. The substratum is yellowish brown very channery loam or very channery sandy loam that extends to bedrock at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of well drained Calvin soils, moderately well drained Ernest soils, soils that are less than 20 inches deep to bedrock, and soils that are more than 40 inches deep to bedrock. Also included are small areas of soils that are not as well drained as this Dekalb soil, soils that do not have stones on the surface, and soils where stones cover more than 90 percent of the surface. Included soils make up about 25 percent of this map unit.

The available water capacity of this Dekalb soil is very low to moderate. Permeability is moderately rapid or rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. Most areas are wooded, but the soil has low potential for trees and the slope and stones limit the use of timber equipment. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

EnB—Ernest silt loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. Most areas are on alluvial fans and foot slopes.

Typically the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is 49 inches thick. The upper 2 inches is a yellowish brown, friable silt loam. The next 17 inches is pale brown, firm shaly silty clay loam mottled with yellowish brown and light brownish gray in the lower part. The lower 30 inches is very firm and brittle, yellowish brown and brown shaly silt loam mottled with light brownish gray. The substratum is brown very shaly silt loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Brinkerton Variant soils, reddish soils, and stony soils. Also included are a few small areas of soils that are sandier than this Ernest soil, soils that are less than 40 inches deep to bedrock, and soils near Leading Creek that have a subsoil of silty clay. Included soils make up about 20 percent of this map unit.

The available water capacity of this Ernest soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is medium, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

This soil is suited to and mainly used for cultivated crops and hay and pasture. The hazard of erosion is moderate in unprotected areas and is a management concern. Some places have small wet areas that need drainage for desirable crops, and some other areas need diversions to intercept runoff from higher areas. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, the moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

EnC—Ernest silt loam, 8 to 15 percent slopes. This soil is strongly sloping and moderately well drained. Most areas are on foot slopes, along drainageways, and in coves.

Typically the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is 49 inches thick. The upper 2 inches is a yellowish brown, friable silt loam. The next 17 inches is pale brown, firm shaly silty clay loam mottled with yellowish brown and light brownish gray in the lower part. The lower 30 inches is very firm and brittle, yellowish brown and brown shaly silt loam mottled with light brownish gray. The substratum is brown very shaly silt loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Buchanan soils and somewhat poorly drained Brinkerton Variant soils. Also included are a few small areas of well drained soils, very stony soils, and soils that are sandier than this Ernest soil. Included soils make up about 20 percent of this map unit.

The available water capacity of this Ernest soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some plants. The depth to bedrock is generally greater than 60 inches.

This soil is suited to and used mainly for cultivated crops and hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. Some places have small wet areas that need drainage for desirable crops, and some other areas need diversions to intercept runoff from higher areas. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

Slope, the seasonal high water table, the moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

EnD—Ernest silt loam, 15 to 25 percent slopes. This soil is moderately steep and moderately well drained. Most areas are on foot slopes, along drainageways, and in coves.

Typically the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is 44 inches thick. The upper 15 inches is pale brown, firm shaly silty clay loam mottled with yellowish brown and light brownish gray in the lower part. The lower 29 inches is very firm and brittle, yellowish brown and brown shaly silt loam mottled with light brownish gray. The substratum is brown very shaly silt loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Buchanan soils and well drained soils. Also included are small areas of very stony soils, soils that do not have a brittle layer in the subsoil, and soils that are sandier than this Ernest soil. Included soils make up about 25 percent of this map unit.

The available water capacity of this Ernest soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

Slope limits the suitability of this soil for cultivated crops; the soil is better suited and is used mainly for hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. In places diversions help to intercept runoff from higher areas. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment. Its use is further restricted during wet seasons because the soil is soft.

Slope, the seasonal high water table, the moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use.

Maintaining the plant cover on construction sites, establishing plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

EsC—Ernest rubbly silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is moderately well drained. Most areas are along drainageways and in coves near Cheat Mountain, Shavers Mountain, and Dolly Sods. The areas are mainly at an elevation of more than 3,000 feet. Stones and boulders 1 to 6 feet in diameter cover 50 to 90 percent of the surface of the soil.

Typically the surface layer is very dark grayish brown and brown silt loam about 5 inches thick. The subsoil is 45 inches thick. The upper 4 inches is a yellowish brown, friable silt loam. The next 14 inches is pale brown, firm channery silty clay loam mottled with yellowish brown and light brownish gray in the lower part. The lower 27 inches is very firm and brittle, yellowish brown and brown channery silt loam mottled with light brownish gray. The substratum is brown very channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Dekalb soils, moderately well drained Buchanan soils, and somewhat poorly drained Brinkerton Variant soils; areas that mostly consist of very poorly drained organic material; and areas where stones cover more than 90 percent of the surface. Also included are a few small areas of soils with no stones on the surface and soils that are less than 40 inches deep to bedrock. Included soils make up about 25 percent of this map unit.

The available water capacity of this Ernest soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is medium or rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some plants. The depth to bedrock is generally greater than 60 inches.

The stones on the surface make this soil generally unsuitable for farming. The soil is mainly wooded and has fair potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. The stones on the surface limit the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

The stones on the surface, the seasonal high water table, slope, the moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

EsE—Ernest rubbly silt loam, 15 to 35 percent slopes. This soil is moderately steep or steep and is moderately well drained. Most areas are along drainageways and in coves near Cheat Mountain, Shavers Mountain, and Dolly Sods. The areas are mainly at an elevation of more than 3,000 feet. Stones 1 to 6 feet in diameter cover 50 to 90 percent of the surface of the soil.

Typically the surface layer is very dark grayish brown and brown silt loam about 5 inches thick. The subsoil is 45 inches thick. The upper 4 inches is yellowish brown, friable silt loam. The next 14 inches is pale brown, firm channery silty clay loam mottled with yellowish brown and light brownish gray in the lower part. The lower 27 inches is very firm and brittle, yellowish brown and brown channery silt loam mottled with light brownish gray. The substratum is brown very channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Dekalb soils, moderately well drained Buchanan soils, and somewhat poorly drained Brinkerton Variant soils; areas that mainly consist of very poorly drained organic material; and areas where stones cover more than 90 percent of the surface. Also included are a few small areas of soils that do not have stones on the surface and soils that are less than 40 inches deep to bedrock. Included soils make up about 25 percent of this map unit.

The available water capacity of this Ernest soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is rapid or very rapid, and natural fertility is low or moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some plants. The depth to bedrock is generally greater than 60 inches.

Slope and the stones on the surface make this soil generally unsuitable for farming. The soil is mainly wooded and has fair potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope and the stones on the surface limit the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

The stones on the surface, slope, the seasonal high water table, the moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

Fu—Fluvaquents-Udifluvents complex. This complex consists of moderately deep and deep, well drained to

poorly drained soils on flood plains mostly at an elevation of more than 3,000 feet. The soils are so intermingled that it was not practical to map them separately. The complex is about 40 percent Fluvaquents, 30 percent Udifluvents, and 30 percent other soils.

Included with this unit in mapping are a few small areas of Buchanan and Ernest soils, gently sloping soils, and soils with a very gravelly or very cobbly subsoil.

The available water capacity, permeability, natural fertility, and many other characteristics of this complex are variable. Where unlimed, the soils are strongly acid or very strongly acid throughout. The depth to bedrock ranges from 20 inches to more than 60 inches.

A severe hazard of flooding and the variability of soil properties make these soils poorly suited to farming or other uses. Many areas are in low brush and are used for pasture or wildlife habitat.

This unit is not assigned to a subclass.

GcC—Gilpin channery silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. Most areas are on ridgetops in the western part of the survey area.

Typically the surface layer is black and dark grayish brown channery silt loam 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 3 inches is friable silt loam, and the lower 13 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb soils. Also included are a few small areas of severely eroded soils and soils that are more than 40 inches deep to bedrock, some of which have a clayey subsoil. Included soils make up about 20 percent of this map unit.

The available water capacity of this Gilpin soil is low to moderate. Permeability is moderate. Runoff is medium to rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suited to cultivated crops and to hay and pasture. It is used mainly for hay and pasture. The hazard of erosion is moderate to severe in unprotected areas and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

GcD—Gilpin channery silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on ridgetops and side slopes in the western part of the survey area. Drainageways dissect some areas.

Typically the surface layer is black and dark grayish brown channery silt loam 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 3 inches is friable silt loam, and the lower 13 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are a few small areas of Dekalb soils. Also included are a few small areas of stony soils and severely eroded soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Gilpin soil is low to moderate. Permeability is moderate. Runoff is rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope limits the suitability of this soil for cultivated crops; the soil is better suited to and is mainly used for hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, and some of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover in unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

GcE—Gilpin channery silt loam, 25 to 35 percent slopes. This soil is steep and well drained. Most areas are on side slopes in the western part of the survey area.

Typically the surface layer is black and dark grayish brown channery silt loam about 4 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are a few small areas of well drained Lily soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that are more than 40 inches deep to bedrock, stony soils, and severely eroded soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Gilpin soil is low to moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock ranges from 20 to 40 inches.

Slope makes this soil generally unsuitable for cultivated crops or hay; the soil is better suited to pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover in unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIe.

GcF—Gilpin channery silt loam, 35 to 70 percent slopes. This soil is very steep and well drained. Most areas are on side slopes in the western part of the survey area.

Typically the surface layer is black and dark grayish brown channery silt loam about 4 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are a few small areas of well drained Dekalb soils and moderately well drained Buchanan and Ernest soils. Also included are a few small areas of stony soils and severely eroded soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Gilpin soil is low to moderate. Permeability is moderate. Runoff is very rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock ranges from 20 to 40 inches.

Slope makes this soil generally unsuitable for farming. The soil has moderately high to high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover in unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIe.

GdC—Gilpin-Dekalb stony complex, 3 to 15 percent slopes. This complex consists of strongly sloping to gently sloping, well drained soils on benches and ridgetops. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soils. The complex is about 50 percent Gilpin stony silt loam, 35 percent Dekalb stony loam, and 15 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 3 inches is friable silt loam and the lower 13 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 33 inches.

Included with these soils in mapping are small areas of well drained Lily soils, moderately well drained Buchanan and Ernest soils, and soils that do not have stones on the surface. Also included are a few small areas of soils that have more stones on the surface than this complex and areas of soils that are steeper.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is medium or rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout.

The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

The stones on the surface make these soils generally unsuitable for farming. Most areas are wooded. The soils have moderately high potential for trees. Erosion on logging roads and skid trails is a major management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope, the stones on the surface, and the limited depth to bedrock are the main limitations of these soils for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

GdE—Gilpin-Dekalb stony complex, 15 to 35 percent slopes. This complex consists of steep or moderately steep, well drained soils mostly on side slopes. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soils. The complex is about 45 percent Gilpin stony silt loam, 40 percent Dekalb stony loam, and 15 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with these soils in mapping are small areas of Buchanan and Ernest soils, soils that do not have stones on the surface, and soils where stones cover more than 3 percent of the surface. Also included are small areas of strongly sloping soils, very steep soils, and exposed bedrock.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is rapid or very rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make these soils generally unsuitable for farming. Most areas are used for woodland, and the soils have moderately high to high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of these soils for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

GdF—Gilpin-Dekalb stony complex, 35 to 70 percent slopes. This complex consists of very steep, well drained soils on side slopes. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soils. The complex is about 40 percent Gilpin stony loam, 40 percent Dekalb stony loam, and 20 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 4 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with these soils in mapping are small areas of moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have no stones on the surface, soils where stones cover more than 3 percent of the surface, and soils that have slopes of less than 35 percent.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is very rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make these soils generally unsuitable for farming. Most areas are wooded, and the soils have moderately high to high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of these soils for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and

providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

GkC—Gilpin-Dekalb stony complex, moist, 3 to 15 percent slopes. This complex consists of gently sloping to strongly sloping, well drained soils on benches and ridgetops at an elevation where the average annual precipitation exceeds 50 inches. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soils. The complex is about 50 percent Gilpin stony loam, 35 percent Dekalb stony loam, and 15 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 10 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 33 inches.

Included with these soils in mapping are small areas of moderately well drained Cookport Variant, Buchanan, and Ernest soils. Also included are a few small areas of soils that have no stones on the surface, soils where stones cover more than 3 percent of the surface, and soils that have slopes of more than 15 percent.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is medium or rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock a depth of 20 to 40 inches.

The stones on the surface make these soils generally unsuitable for farming. The soils are mainly used for woodland, and they have moderately high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of these soils for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

GkE—Gilpin-Dekalb stony complex, moist, 15 to 35 percent slopes. This complex consists of steep or moderately steep, well drained soils on side slopes at an elevation where the average annual precipitation exceeds 50 inches. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1 to 3 percent of the surface of the soils. The complex is about 45 percent Gilpin stony loam, 40 percent Dekalb stony loam, and 15 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 5 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with these soils in mapping are small areas of moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have no stones on the surface, soils where stones cover more than 3 percent of the surface, soils that have slopes of less than 15 percent or more than 35 percent, and areas of exposed bedrock.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is rapid or very rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make these soils generally unsuitable for farming. The soils are used mainly for woodland, and they have high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of these soils for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

GkF—Gilpin-Dekalb stony complex, moist, 35 to 70 percent slopes. This complex consists of very steep, well drained soils on side slopes at an elevation where the average annual precipitation exceeds 50 inches. The soils are so intermingled that it was not practical to map them separately. Stones 1 to 2 feet in diameter cover 1

to 3 percent of the surface of the soils. The complex is about 40 percent Gilpin stony loam, 40 percent Dekalb stony loam, and 20 percent other soils.

Typically the surface layer of the Gilpin soil is black and dark grayish brown channery silt loam about 4 inches thick. The subsoil is yellowish brown and is 16 inches thick. The upper 4 inches is friable silt loam, and the lower 12 inches is firm silty clay loam and channery silty clay loam. The substratum is yellowish brown very channery silty clay loam that extends to bedrock at a depth of about 26 inches.

Typically the surface layer of the Dekalb soil is brown channery loam about 8 inches thick. The subsoil is yellowish brown, friable channery loam 16 inches thick. The substratum is yellowish brown very channery loam that extends to bedrock at a depth of about 34 inches.

Included with these soils in mapping are small areas of moderately well drained Buchanan and Ernest soils. Also included are a few small areas of soils that have no stones on the surface, soils where stones cover more than 3 percent of the surface, and soils that have slopes of less than 35 percent.

The available water capacity is low to moderate in the Gilpin soil and very low to moderate in the Dekalb soil. Permeability is moderate in the Gilpin soil and moderately rapid or rapid in the Dekalb soil. Runoff is very rapid, and natural fertility is moderate in the Gilpin soil and low in the Dekalb soil. Where unlimed, the soils are strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Slope and the stones on the surface make these soils generally unsuitable for farming. The soils are used mainly for woodland, and they have high potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope, the limited depth to bedrock, and the stones on the surface are the main limitations of these soils for nonfarm use. Maintaining the existing plant cover, extablishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

Ka—Kanawha loam. This soil is nearly level and well drained. The areas are on high flood plains mostly along the Tygart Valley River, but some are along Dry Fork and Shavers Fork.

Typically the surface layer is brown loam about 9 inches thick. The subsoil is reddish brown and is 36 inches thick. The upper 15 inches is firm light clay loam, and the lower 21 inches is friable heavy loam. The substratum is brown loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Linden and Pope soils, moderately well drained Philo and Philo Variant soils, and poorly drained Atkins soils. Also included are a few small areas of gravelly soils. Included soils make up about 20 percent of the map unit.

The available water capacity of this Kanawha soil is high. Permeability is moderate in the subsoil. Runoff is slow or medium, and natural fertility is high. Where unlimed, the soil is medium acid to strongly acid throughout. The depth to bedrock is generally greater than 60 inches. The soil is subject to rare flooding.

This soil is well suited to cultivated crops and to hay and pasture. Most of the acreage is farmed. Cultivated crops can be grown continuously, but the soil needs the protection of a cover crop. Working the residue from the cover crop into the soil helps to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded.

The hazard of flooding is the main limitation of this soil for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control erosion and sedimentation.

The capability class is I.

Kv—Kanawha Variant gravelly loam. This soil is nearly level and well drained. The areas are on high flood plains mostly along the Tygart Valley River, but some are along Dry Fork and Shavers Fork.

Typically the surface layer is dark reddish brown gravelly loam about 9 inches thick. The subsoil is 24 inches thick. The upper 12 inches is red and reddish brown, firm gravelly silt loam. The lower 12 inches is reddish brown, very friable very gravelly silt loam with pockets of very gravelly sandy loam. The substratum extends to a depth of 60 inches or more. It is reddish brown very gravelly silt loam with pockets of sandy loam and very gravelly sandy loam.

Included with this soil in mapping are a few small areas of well drained Kanawha, Linden, and Pope soils and moderately well drained Philo soils. Also included are a few small areas of soils that are not gravelly and soils that have a surface layer of gravelly sandy loam or gravelly silt loam. Included soils make up about 30 percent of this map unit.

The available water capacity of this Kanawha soil is low or moderate. Permeability is moderate or moderately rapid in the subsoil. Runoff is slow or medium, and natural fertility is moderate or high. Where unlimed, the soil is medium acid to strongly acid throughout. The depth to bedrock is generally greater than 60 inches. This soil is subject to rare flooding.

This soil is suited to cultivated crops and to hay and pasture. Most of the acreage is farmed. Cultivated crops can be grown continuously, but the soil needs the protection of a cover crop. Working the residue from the cover crop into the soil helps to maintain fertility and

tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded.

The hazard of flooding and the gravelly texture are the main limitations of this soil for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIs.

LeD—Leetonia rubbly loamy sand, 3 to 25 percent slopes. This soil is gently sloping to moderately steep and is well drained to excessively drained. Most areas are on ridgetops near Cheat Mountain, Shavers Mountain, Flatrock, and Roaring Plains at an elevation of more than 3,000 feet. Stones and boulders 1 to 6 feet in diameter cover 50 to 90 percent of the surface of the soil, and in some areas they are in the soil.

Typically the surface layer is black channery sandy loam about 3 inches thick underlain by gray channery loamy sand about 8 inches thick. The subsoil is 12 inches thick. The upper 4 inches is dark reddish brown, friable sandy loam with stains and streaks of dark reddish gray and yellowish red; the lower 8 inches is brown, loose very channery sandy loam and loamy sand. The substratum is brownish yellow very channery loamy sand that extends to bedrock at a depth of about 41 inches.

Included with this soil in mapping are small areas of well drained Calvin and Dekalb soils. Also included are small areas of soils that are less than 40 inches deep to bedrock, areas of wet soils, areas where stones and boulders cover more than 90 percent of the surface, and areas of soils that have slopes of more than 25 percent. Included areas make up about 30 percent of this map unit.

The available water capacity of this Leetonia soil is very low. Permeability is moderately rapid in the upper part of the soil and rapid in the lower part. Runoff is medium to very rapid, and natural fertility is low. The soil is very strongly acid to extremely acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 40 to 48 inches.

The stones and boulders on and in the soil make it generally unsuitable for farming. Most areas are wooded, but the soil has low potential for trees. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope and the stones on the surface limit the use of equipment.

The stones and boulders, the limited depth to bedrock, and slope are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

LyB—Lily loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. Most areas on broad ridgetops in the western part of the survey area.

Typically the surface layer is black loam about 2 inches thick underlain by brown sandy loam about 11 inches thick. The subsoil is yellowish brown clay loam that extends to bedrock at a depth of about 39 inches.

Included with this soil in mapping are a few small areas of moderately well drained Cookport Variant soils. Also included are a few small areas of soils that are less than 20 inches deep to bedrock and a few areas of stony soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Lily soil is moderate. Permeability is moderately rapid in the subsoil. Runoff is medium, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suitable for cultivated crops and for hay and pasture. The hazard of erosion is moderate and is a management concern. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion.

The limited depth to bedrock is the main limitation of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

LyC—Lily loam, 8 to 15 percent slopes. This soil is strongly sloping and well drained. Most areas are on ridgetops in the western part of the survey area.

Typically the surface layer is black loam about 2 inches thick underlain by brown sandy loam about 10 inches thick. The subsoil is yellowish brown clay loam that extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of moderately well drained Cookport Variant soils. Also included are a few small areas of soils that are less than 20 inches deep to bedrock and areas of stony soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Lily soil is moderate. Permeability is moderately rapid in the subsoil.

Runoff is rapid, and natural fertility is low. Where unlimed, the soil is strongly acid or very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

This soil is suitable for cultivated crops and for hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has moderately high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

MkC—Meckesville stony silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. Most areas are on foot slopes, on benches, along drainageways, and in coves. Stones cover 1 to 3 percent of the surface of the soil.

Typically the surface layer is dark reddish gray silt loam about 3 inches thick. The subsoil is reddish brown and is 47 inches thick. The upper 5 inches is very friable heavy silt loam. The next 21 inches is firm gravelly silty clay loam. The lower 21 inches is very firm and brittle gravelly heavy loam and gravelly silt loam that is mottled with reddish brown in the lower part. The substratum is dark reddish brown very gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Belmont, Calvin high base substratum, and Shouns soils; soils that are not so well drained as this Meckesville soil; and soils that are less acid in the substratum. Also included are a few small areas of severely eroded soils, soils that do not have a brittle layer in the subsoil, soils that do not have stones on the surface, and soils where more than 3 percent of the surface is covered by stones. Included soils make up about 40 percent of this map unit.

The available water capacity of this Meckesville soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow in the brittle part. Runoff is medium or rapid, and natural fertility is moderate or high. A seasonal high water table about 2-1/2 to 3-1/2 feet below the surface restricts the root zone of some types of plants. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock is generally greater than 60 inches.

The stones on the surface restrict the use of farm machinery and make this soil unsuitable for cultivated crops or hay, but the soil is suited to pasture. The hazard of erosion is severe in unprotected areas and is a management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has a high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft

The slope, seasonal high water table, moderately slow permeability, and stones on the surface and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

MkE—Meckesville stony silt loam, 15 to 35 percent slopes. This soil is moderately steep and steep and is well drained. Most areas are on foot slopes, on benches, along drainageways, and in coves. Stones cover 1 to 3 percent of the surface of the soil.

Typically the surface layer is dark reddish gray silt loam about 3 inches thick. The subsoil is reddish brown and is 45 inches thick. The upper 5 inches is very friable heavy silt loam. The next 21 inches is firm gravelly silty clay loam. The lower 19 inches is very firm and brittle gravelly heavy loam and gravelly silt loam that is mottled with reddish brown in the lower part. The substratum is dark reddish brown very gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Belmont, Calvin high base substratum, and Shouns soils; soils that are not so well drained as this Meckesville soil; and soils that are less acid in the substratum. Also included are a few small areas of severely eroded soils, soils that do not have a brittle layer in the subsoil, soils that do not have stones on the surface, and soils where more than 3 percent of the surface is covered by stones. Included soils make up about 40 percent of this map unit.

The available water capacity of this Meckesville soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow in the brittle part. Runoff is rapid, and natural fertility is moderate or high. A seasonal high water table 2-1/2 to 3-1/2 feet below the surface restricts the root zone of some types of plants. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock is generally greater than 60 inches.

Slope and the stones on the surface restrict the use of farm machinery and make this soil unsuitable for cultivated crops or hay, but the soil is suited to pasture. The hazard of erosion is severe in unprotected areas and is a management concern. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has a high potential for trees, and most of the acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

The slope, seasonal high water table, moderately slow permeability, and stones on the surface and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIs.

Mm—Medihemists, moderately deep. These soils consist of nearly level, very poorly drained organic material mostly in depressions on broad mountaintops near Flatrock and Roaring Plains.

Typically the surface layer is black muck about 12 inches thick. The next layer is dark brown mucky peat about 28 inches thick. These organic materials are underlain by heavy silty clay loam or silty clay that extends to a depth of 60 inches or more.

Included with these soils in mapping are small areas of Brinkerton Variant and Ernest soils and well decomposed organic material. Also included are small areas of soils less than 40 inches deep to bedrock. Included soils make up about 20 percent of this map unit.

The available water capacity of Medihemists is high. Permeability is very slow, and natural fertility is low. Unless limed, the soils are very strongly acid or extremely acid throughout. The depth to bedrock is more than 40 inches.

The content of water makes these soils unsuitable for farming, woodland, or urban uses. Most areas are used for recreation or wildlife habitat.

This unit is not assigned to a capability subclass.

MoA—Monongahela silt loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. The areas are on high terraces mainly along the Tygart Valley River and Leading Creek.

Typically the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is yellowish brown and is 47 inches thick. The upper 15 inches is friable silt loam; the lower 32 inches is very firm and brittle loam and cobbly loam mottled with yellowish brown and light brownish gray. The substratum is mixed strong brown and light gray cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Tygart and Tygart Variant soils. Also included are small areas of soils that are less than 60 inches deep to bedrock and areas of well drained soils. Included soils make up about 10 percent of this map unit.

The available water capacity of this Monongahela soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is slow, and natural fertility is moderate to low. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is farmed. Some small wet areas need drainage in order to be suitable for desirable crops. Cultivated crops can be grown continuously, but the soil needs the protection of a cover crop. If this soil is cultivated, delaying tillage until the soil is reasonably dry and working the residue from the cover crop into the soil help to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

This soil has a moderately high potential for trees, but only a small acreage is wooded. The use of equipment is restricted during wet periods because the soil is soft.

The seasonal high water table and moderately slow or slow permeability and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIw.

MoB—Monongahela silt loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. The areas are on high terraces mainly along the Tygart Valley River and Leading Creek.

Typically the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is yellowish brown and is 45 inches thick. The upper 15 inches is friable silt loam; the lower 30 inches is very firm and brittle loam and cobbly loam mottled with yellowish brown and light brownish gray. The substratum is mixed strong brown and light gray cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of somewhat poorly drained Tygart and Tygart Variant soils. Also included are small areas of soils that are less than 60 inches deep to bedrock and areas of deep, well drained soils. Included soils make up about 10 percent of this map unit.

The available water capacity of his Monongahela soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is medium, and natural fertility is moderate to low. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is farmed. The hazard of erosion is moderate in unprotected areas and is a management concern. Some small wet areas need drainage in order to be suitable for desirable crops. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table and moderately slow or slow permeability and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

MoC—Monongahela silt loam, 8 to 15 percent slopes. This soil is strongly sloping and moderately well drained. The soil is mainly along the Tygart Valley River and Leading Creek on the edges of high terraces and in areas dissected by drainageways.

Typically the surface layer is dark grayish brown silt loam about 7 inches thick. The subsoil is yellowish brown and is 41 inches thick. The upper 13 inches is friable silt loam; the lower 28 inches is very firm and brittle loam and cobbly loam mottled with yellowish brown and light brownish gray. The substratum is mixed strong brown and light gray cobbly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of soils that are less than 60 inches deep to bedrock and areas of deep, well drained soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Monongahela soil is moderate. Permeability is moderate above the brittle part of the subsoil and moderately slow or slow in the brittle part. Runoff is rapid, and natural fertility is moderate to low. Where unlimed, the soil is strongly acid or very strongly acid throughout. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of plants. The depth to bedrock is generally greater than 60 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is used for hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern. The use of equipment is restricted during wet seasons because the soil is soft.

Slope, the seasonal high water table and moderately slow or slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

Ph—Philo loam. This soil is nearly level and moderately well drained. The areas are on flood plains that are subject to common flooding.

Typically the surface layer is dark grayish brown loam about 9 inches thick. The subsoil is dark yellowish brown and brown, friable loam 15 inches thick and is mottled with dark grayish brown in the lower part. The substratum is mixed gray and brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Pope soils and poorly drained Atkins soils. Also included are a few small areas of gravelly soils and reddish soils that are less acid than this Philo soil. Included soils make up about 20 percent of this map unit.

The available water capacity of this Philo soil is moderate to high. Permeability is moderate or moderately slow in the subsoil. Runoff is slow or very slow, and natural fertility is moderate. A seasonal high water table about 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock is greater than 48 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is farmed. Some small

wet areas need drainage in order to be suitable for desirable crops, and crops in some areas are subject to damage from flooding. Cultivated crops can be grown continuously, but the soil needs the protection of a cover crop. Delaying tillage until the soil is reasonably dry and working the residue from the cover crop into the soil help to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing in the spring until the soil is reasonably firm are major pasture management needs.

The soil has very high potential for trees, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The hazard of flooding, the seasonal high water table, and a frost action potential limit this soil for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control scouring and sedimentation.

The capability subclass is IIw.

Pm—Philo Variant silt loam. This soil is nearly level and moderately well drained. The areas are on high flood plains that are subject to rare flooding.

Typically the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil is firm, reddish brown and strong brown silty clay loam 32 inches thick and is mottled with pinkish gray. The substratum is brown and gray fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Kanawha soils and somewhat poorly drained Tygart and Tygart Variant soils. Also included are a few small areas of soils that are loam throughout. Included soils make up about 20 percent of this map unit.

The available water capacity of this Philo soil is high. Permeability is moderate in the subsoil. Runoff is slow or medium, and natural fertility is moderate to high. Where unlimed, the soil is strongly acid or medium acid throughout. A seasonal high water table 1-1/2 to 3 feet below the surface restricts the root zone of some types of plants. The depth to bedrock is generally greater than 60 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is farmed. Some small wet areas need drainage in order to be suitable for desirable crops. Cultivated crops can be grown continuously, but the soil needs the protection of a cover crop. Delaying tillage until the soil is reasonably dry and working the residue from the cover crop into the soil help to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing in the spring until the soil is reasonably firm are major pasture management needs.

The soil has very high potential for trees, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table and hazard of flooding and a frost action potential are the main limitations of this soil for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIw.

Pn—Pope-Atkins complex. This complex consists of nearly level, well drained and poorly drained soils on flood plains that are subject to common flooding. The soils are so intermingled that it was not practical to map them separately. The complex is about 30 percent Pope fine sandy loam, 25 percent Atkins silt loam, and 45 percent other soils.

Typically the surface layer of the Pope soil is dark grayish brown fine sandy loam about 8 inches thick. The subsoil is friable, dark yellowish brown and brown fine sandy loam 34 inches thick and is mottled with pinkish gray in the lower part. The substratum to a depth of 54 inches is brown loam with pockets of loamy sand mottled with pinkish gray. From 54 inches to a depth of 60 inches or more, it is brown stratified sand and gravel.

Typically the surface layer of the Atkins soil is dark grayish brown silt loam about 4 inches thick underlain by 10 inches of gray heavy loam mottled with brown. The subsoil is gray, very friable heavy loam 34 inches thick and is mottled with brown. The substratum is mixed gray and brown sand and gravel to a depth of 60 inches or more.

Included with these soils in mapping are small areas of well drained to somewhat excessively drained Pope Variant soils and moderately well drained Philo and Ernest soils. Also included are a few small areas of Udifluvents, soils with a reddish subsoil, and poorly drained soils that have a gravelly subsoil.

The available water capacity is moderate or high in the Pope soil and high in the Atkins soil. Permeability is moderate or moderately rapid in the subsoil of the Pope soil and moderately slow or slow in the subsoil of the Atkins soil. Runoff is slow on the Pope soil and very slow on the Atkins soil. Natural fertility is moderate. Where unlimed, the soils are strongly or very strongly acid throughout. The depth to bedrock is generally greater than 60 inches. The Atkins soil has a seasonal high water table at or near the surface which restricts the root zone of many types of plants.

The hazard of flooding and wetness limit the suitability of these soils for cultivated crops and hay; the soils are better suited to and mainly used for pasture. Most areas are long and narrow and are dissected by abandoned stream channels, making the areas difficult to manage for farming. In addition, cultivation of the Atkins soil requires drainage, but suitable outlets are unavailable in some areas. If these soils are cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soils are reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. The use of proper stocking rates to maintain desirable

grasses and legumes, the use of rotational grazing, and deferment of grazing until the soils are reasonably firm are the major pasture management needs.

A small acreage of this complex is wooded. The Pope soil has high potential for trees, and the Atkins soil has very high potential for water-tolerant trees. The use of equipment is restricted during wet seasons because the Atkins soil is soft.

The hazard of flooding, the seasonal high water table, the moderately slow or slow permeability, and a frost action potential in the Atkins soil are the main limitations of this complex for nonfarm use. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control stream scouring and sedimentation.

The capability subclass is IVw.

Po—Pope and Linden fine sandy loams. This unit consists of nearly level, well drained soils along the Tygart Valley River and its tributaries. The soils are on flood plains that are subject to common flooding. Some areas of this unit are made up of Pope soils, some of Linden soils, and some of both. The soils were mapped together because they have no major differences in use and management. The total acreage of the unit is about 45 percent Pope fine sandy loam, 40 percent Linden fine sandy loam, and 15 percent other soils.

Typically the surface layer of the Pope soil is dark grayish brown fine sandy loam about 8 inches thick. The subsoil is dark yellowish brown and brown, friable fine sandy loam 34 inches thick and is mottled with pinkish gray. The substratum to a depth of 54 inches is brown loam with pockets of loamy sand mottled with pinkish gray. From 54 inches to a depth of 60 inches or more, it is brown stratified sand and gravel.

Typically the surface layer of the Linden soil is dark reddish brown fine sandy loam about 11 inches thick. The subsoil is dark reddish brown and friable and is 15 inches thick. The upper 9 inches is fine sandy loam, and the lower 6 inches is sandy loam. The substratum to a depth of 45 inches is dark reddish brown loamy sand. From 45 inches to a depth of 60 inches or more, it is dark reddish brown very gravelly loamy sand.

Included with these soils in mapping are a few areas of well drained Pope Variant soils, moderately well drained Philo soils, and poorly drained Atkins soils. Also included are a few small areas of soils that are loamy sand or sand throughout.

The Pope and Linden soils have moderate or high available water capacity. Permeability is moderate or moderately rapid in the subsoil. Runoff is slow, and natural fertility is moderate. Where unlimed, the Pope soil is strongly acid to extremely acid throughout and the Linden soil is strongly acid or medium acid. The depth to bedrock in these soils is generally greater than 60 inches.

These soils are suitable for cultivated crops and for hay and pasture; most of the acreage is used for hay and pasture. Cultivated crops can be grown continuously, but the soils need the protection of a cover crop. In places crops are subject to damage from flooding. Working residue from the cover crop into the soil helps to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is firm are major pasture management needs.

These soils have high potential for trees, but only a small acreage is wooded.

The hazard of flooding limits these soils for nonfarm uses. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control scouring and sedimentation.

The capability subclass is IIw.

Pv—Pope Variant gravelly sandy loam. This soil is nearly level and well drained or somewhat excessively drained. The areas are on flood plains mainly along the upper reaches of the Tygart Valley River and Dry Fork and their tributaries. These areas are commonly flooded.

Typically the surface layer is dark grayish brown and dark brown gravelly sandy loam about 9 inches thick. The subsoil is friable and loose and is dark yellowish brown. The upper 10 inches of the subsoil is very gravelly coarse loamy sand, and the lower 7 inches is very gravelly coarse sand and very gravelly loamy sand. The substratum is dark yellowish brown and yellowish brown very gravelly coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of well drained Pope, Linden, and Kanawha Variant soils. Also included are a few small areas of Udifluvents and soils that are gravelly sandy loam throughout. Included soils make up about 25 percent of this map unit.

The available water capacity of this Pope soil is very low or low. Permeability is rapid or very rapid throughout. Runoff is slow, and natural fertility is low or moderate. Where unlimed, the soil is strongly acid to neutral. The depth to bedrock is generally greater than 60 inches.

This soil is suitable for cultivated crops and for hay and pasture. Most of the acreage is farmed. Droughtiness during dry seasons is a major management concern. Using cover crops, minimum tillage, and a crop sequence that includes hay and working the residue from the cover crop into the soil help to improve the moisture holding capacity and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing during dry seasons are major pasture management needs.

The soil has a moderately high potential for trees, but only about one-third of the acreage is wooded.

The hazard of flooding, the rapid or very rapid permeability, and the gravel content limit this soil for nonfarm use. Establishing a plant cover on unprotected

areas and providing for proper surface water disposal help to control stream scouring and sedimentation.

The capability subclass is IIIs.

Py—Purdy silt loam. This soil is nearly level and poorly drained or very poorly drained. Most areas are on low terraces along the Tygart Valley River and Leading Creek.

Typically the surface layer is dark grayish brown silt loam about 9 inches thick and is mottled with brown. The subsoil is 33 inches thick. The upper 10 inches is gray, firm silty clay loam mottled with strong brown; the lower 23 inches is dark gray, sticky silty clay mottled with strong brown. The substratum is gray silty clay to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of moderately well drained Zoar soils, somewhat poorly drained Tygart and Tygart Variant soils, and very poorly drained or poorly drained Blago soils. Also included are a few small areas of soils that have a surface layer of silty clay loam or clay loam and areas along Leading Creek of soils that are less than 60 inches deep to bedrock and soils that are flooded. Included soils make up about 30 percent of this map unit.

The available water capacity of this Purdy soil is high, and permeability is slow in the subsoil. Runoff is very slow, and water is ponded on the surface of some areas. Natural fertility is low. A seasonal high water table at or near the surface restricts the root zone of many types of plants. Where unlimed, the soil is strongly acid to extremely acid throughout. The depth to bedrock is greater than 60 inches.

The seasonal high water table limits the suitability of the soil for cultivated crops; most of the acreage is better suited to and used for water-tolerant hay and pasture plants. Artificial drainage is needed and is a major farming management concern, but the soil is difficult to drain and some areas lack suitable drainage outlets. In places diversions help to intercept runoff from higher areas. If this soil is cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has very high potential for water-tolerant trees, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table and slow permeability, low strength, and a frost action potential are the main limitations of this soil for nonfarm use. Flooding is an additional limitation in some low areas. Establishing a plant cover on unprotected areas and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVw.

Rn—Rubble land. This unit consists of areas where stones and boulders 1 to 6 feet in diameter cover 90 percent or more of the surface. These areas are mainly at an elevation of more than 3,000 feet and are mostly on Cheat Mountain, Shavers Mountain, Flatrock, and Roaring Plains. Slopes range from 3 to 65 percent. A few areas have sparse stands of red spruce.

Included with this unit in mapping are a few small areas of Brinkerton Variant, Dekalb, Ernest, and Leetonia soils that make up about 10 percent of this map unit.

Slope, location, and the stones on the surface make this soil unsuitable for most uses other than recreation or wildlife habitat.

This unit is not assigned to a capability subclass.

ShC—Shouns silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. Most areas are on foot slopes, on alluvial fans, and along drainageways.

Typically the surface layer is brown silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is brown, firm heavy silt loam to a depth of 15 inches; reddish brown, firm silty clay loam to a depth of 45 inches; and reddish brown, firm shaly clay loam at a depth of more than 45 inches.

Included with this soil in mapping are a few small areas of well drained Belmont and Meckesville soils, soils that are less than 40 inches deep to bedrock, and soils that are very strongly acid in the lower part. Also included are a few small areas of severely eroded soils and somewhat poorly drained soils and areas with stones on the surface. Included areas make up about 20 percent of this map unit.

The available water capacity of this Shouns soil is moderate or high. Permeability is moderate. Runoff is medium or rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or medium acid throughout. The depth to bedrock is greater than 60 inches.

This soil is suited to cultivated crops and to hay and pasture. Most of the acreage is used for hay and pasture. The hazard of erosion is moderate or severe and is a management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, maintaining natural drainageways in sod, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

This soil has a high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

Slope and low strength are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIe.

ShD—Shouns silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on foot slopes, on alluvial fans, and along drainageways.

Typically the surface layer is brown silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. It is brown, firm heavy silt loam to a depth of 15 inches; reddish brown, firm silty clay loam to a depth of 44 inches; and reddish brown, firm shaly clay loam at a depth of more than 44 inches.

Included with this soil in mapping are a few small areas of well drained Belmont and Meckesville soils, soils that are less than 40 inches deep to bedrock, and soils that are very strongly acid in the lower part. Also included are a few small areas of severely eroded soils, and somewhat poorly drained soils, areas with stones on the surface, and areas of exposed bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of this Shouns soil is moderate or high. Permeability is moderate. Runoff is rapid, and natural fertility is moderate. Where unlimed, the soil is strongly acid or medium acid throughout. The depth to bedrock is greater than 60 inches.

Slope limits the suitability of this soil for cultivated crops; the soil is better suited to and mainly used for hay and pasture. The hazard of erosion is severe in unprotected areas and is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, maintaining natural drainageways in sod, and returning crop residue to the soil help to control erosion and to maintain fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes and the use of rotational grazing are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment, and its use is further restricted during wet seasons because the soil is soft.

Slope and low strength are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVe.

Tg—Tygart silt loam. This soil is nearly level and somewhat poorly drained. Most areas are on terraces along the Tygart Valley River and Leading Creek.

Typically the surface layer is grayish brown silt loam about 7 inches thick. The subsoil is 39 inches thick. The upper 3 inches is brown, firm silt loam mottled with strong brown. The next 23 inches is yellowish brown and gray, sticky silty clay loam and silty clay mottled with gray and strong brown. The lower 13 inches is gray, firm heavy silty clay loam mottled with strong brown. The substratum extends to a depth of 60 inches or more. It is gray silty clay mottled with strong brown.

Included with this soil in mapping are a few small areas of somewhat poorly drained Tygart Variant soils and poorly drained or very poorly drained Blago and Purdy soils. Also included are a few areas of moderately well drained soils and soils that are flooded. Included soils make up about 20 percent of this map unit.

The available water capacity of this Tygart soil is moderate or high. Permeability is slow in the subsoil. Runoff is slow, and natural fertility is low. A seasonal high water table at a depth of 1/2 foot to 1-1/2 feet restricts the root zone of many types of plants. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock is greater than 60 inches.

This soil is suited to cultivated crops, but it is better suited to and mainly used for water-tolerant hay and pasture plants. The soil is difficult to drain, but surface drainage is generally more effective than tile drainage and is commonly needed for cultivated crops. If the soil is cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, low strength, the slow permeability, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIw.

Tv—Tygart Variant silt loam. This soil is nearly level and somewhat poorly drained. Most areas are on terraces along the Tygart Valley River and Leading Creek.

Typically the surface layer is brown silt loam about 10 inches thick and is mottled with light gray. The subsoil is 50 inches thick. The upper 11 inches is pale brown and

light brownish gray, firm loam mottled with brown. The next 19 inches is grayish brown light clay loam mottled with brown. The lower 20 inches is reddish brown, very firm clay loam mottled with pinkish gray. The substratum, at a depth of more than 60 inches, is mixed light brownish gray and brown stratified sand and gravel.

Included with this soil in mapping are a few small areas of somewhat poorly drained Tygart soils and poorly drained soils. Included soils make up about 25 percent of this map unit.

The available water capacity of this Tygart Variant soil is moderate to high. Permeability is slow in the subsoil. Runoff is slow, and natural fertility is low. A seasonal high water table at a depth of 1/2 foot to 1-1/2 feet restricts the root zone of many types of plants. Where unlimed, the soil is strongly acid or very strongly acid throughout. The depth to bedrock is greater than 60 inches.

This soil is suited to cultivated crops, but it is better suited to and mainly used for water-tolerant hay and pasture plants. Drainage is needed for cultivated crops, and tile drainage is generally an effective type. If the soil is cultivated, using minimum tillage and a crop sequence that includes hay, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are the major pasture management needs.

The soil has high potential for trees, but only a small acreage is wooded. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, the slow permeability, low strength, and a frost action potential are the main limitations of this soil for nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIIw.

Ud—Udifluvents, cobbly. This unit consists of deep, well drained and excessively drained soils on flood plains along the major side streams of the Tygart Valley River (fig. 4). Cobblestones and gravel are in and on the soils, and most areas are subject to flooding.

Included with this unit in mapping are a few small areas of Ernest soils and soils that have fewer stone fragments than Udifluvents. Included soils make up about 15 percent of this unit.

The available water capacity of Udifluvents is very low. Permeability is rapid or very rapid, and natural fertility is low. Where unlimed, the soils are very strongly acid to neutral throughout. The depth to bedrock is greater than 48 inches.

These soils are unsuitable for most uses other than woodland and wildlife habitat.

This unit is not assigned to a capability subclass.

U1—Udorthents, cut and fill. This unit consists of mixed soil material and rock fragments from areas that have been excavated, graded, or filled. The areas of this unit are throughout the survey area, but most are in the Elkins area and along U.S. Route 33 near Bowden. The largest area is at the Elkins-Randolph County Airport.

These soils have been so altered or obscured that identification of the original features is generally impractical. Onsite investigation is necessary to determine the limitations and suitability of this unit for a proposed use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

This unit is not assigned to a capability subclass.

U2—Udorthents, mudstone, high base. This unit is mostly on hillsides and ridgetops on Rich Mountain and Elk Mountain and in small areas in the western and southern parts of the survey area. The areas were surface mined for coal and mostly consist of a high wall, a bench, and an outslope. The high walls are nearly vertical and range from 10 to 50 feet in height. The benches are gently sloping on Elk Mountain and strongly sloping to moderately steep on Rich Mountain, and they range from 100 to 300 feet in width. The outslopes are moderately steep to steep, are variable in width, and make up nearly half of the acreage of the unit.

The areas of this unit on benches typically have a surface layer about 5 inches thick of dark yellowish brown channery silty clay loam with yellowish red mottles. The next 11 inches is friable, brown very channery light silty clay loam with yellowish brown and gray mottles. The lower 26 inches is friable, dark gray and yellowish brown very channery silty clay loam with brownish yellow, red, and gray mottles.

Included with this unit in mapping are a few small areas of other types of Udorthents and a few small areas of Dekalb, Ernest, and Gilpin soils. Included soils make up about 25 percent of this map unit.

The available water capacity, permeability, and natural fertility of Udorthents are variable. Runoff is medium to rapid on the benches and very rapid on the high walls and outslopes. Where unlimed, the soils are slightly acid to mildly alkaline throughout. The erosion hazard is moderate to very severe in unprotected areas.

This unit is mostly unsuitable for farming. The benches have limited suitability for pasture; a few in the Pickens area have been limed and fertilized and are used for hay and pasture. The soils have good potential for woodland or wildlife habitat.

Onsite investigation and testing are needed to determine the limitations and potentials of this unit for most uses.

This unit is not assigned to a capability subclass.

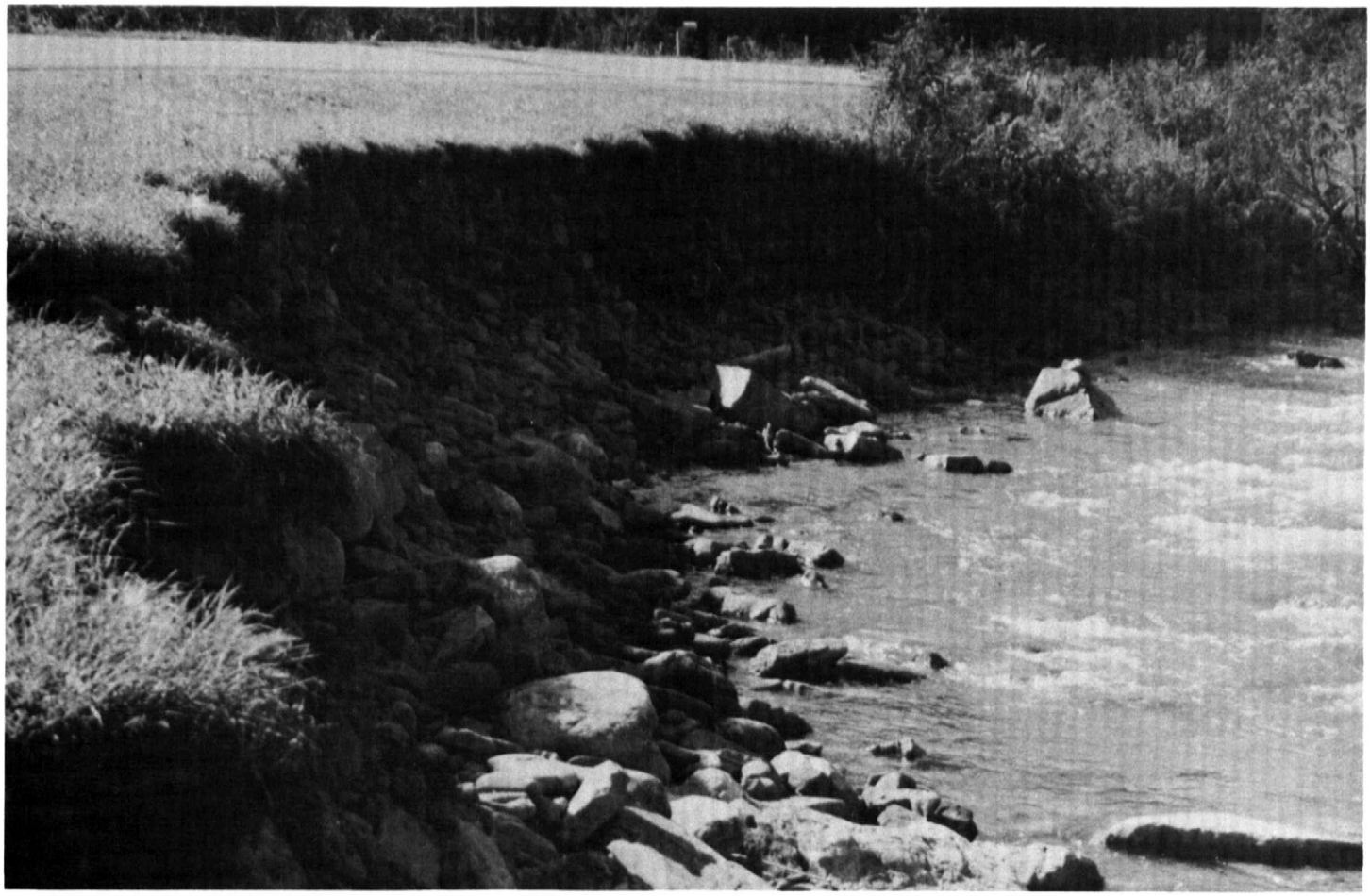


Figure 4. A typical area of Udifluvents, cobbly, along the Dry Fork of the Cheat River.

U3—Udorthents, mudstone, low base. This unit is mostly on hillsides. The areas were surface mined for coal and mostly consist of a high wall, a bench, and an outslope. The high walls are nearly vertical and range from 10 to 40 feet in height. The benches are gently sloping and range from 50 to 250 feet in width. The outslopes are moderately steep to very steep, are variable in width, and make up nearly half of the acreage of the unit.

The areas of this unit on benches typically have a surface layer about 4 inches thick of dark gray very channery silt loam with yellowish brown and grayish brown mottles. The lower 37 inches is firm, dark grayish brown very channery silt loam and very channery light silty clay loam with yellowish brown, yellowish red, light brownish gray, and red mottles.

Included with this unit in mapping are a few small areas of other types of Udorthents. Also included are a few small areas of Gilpin and Dekalb soils, wet soils, and soils with a surface layer of loam. Included soils make up about 30 percent of this map unit.

The available water capacity, permeability, and natural fertility of Udorthents are variable. Runoff is medium to rapid on the benches and very rapid on the high walls and outslopes. Where unlimed, the soils are strongly acid to very strongly acid throughout. The erosion hazard is moderate to very severe in unprotected areas.

This unit is mostly unsuitable for farming. The benches have limited suitability for pasture; a few in the Pickens area have been limed and fertilized and are used for hay and pasture. The soils have good potential for woodland or wildlife habitat.

Onsite investigation and testing are needed to determine the limitations and potentials of this unit for most uses.

This unit is not assigned to a capability subclass.

U4—Udorthents, mudstone and shale, high base. This unit is on ridgetops near the Cassity area. The areas have been surface mined for coal, and most have

been graded to conform to a rounded hill with a broad ridgetop. Slopes are variable but are dominantly 3 to 8 percent.

These soils typically have a surface layer about 4 inches thick of dark brown channery silt loam with light brown, dark gray, and light reddish brown mottles. The next 20 inches is firm, very dark grayish brown channery silt loam with yellowish brown and red mottles. The lower 16 inches is firm, very dark grayish brown very channery silt loam with dark grayish brown, yellowish brown, and red mottles.

Included with this unit in mapping are a few small areas of other types of Udorthents. Also included are a few small areas of Cookport Variant and Brinkerton Variant soils. Included soils make up 20 percent of this map unit.

The available water capacity, permeability, and natural fertility of Udorthents are variable. Runoff is medium to rapid. Where unlimed, the soils are medium acid to mildly alkaline throughout. The erosion hazard is moderate or severe in unprotected areas.

This unit has limited suitability for farming. Reclaimed areas respond well to adequate applications of lime and fertilizer.

Onsite investigation and testing are needed to determine the limitations and potential of this unit for most uses.

This unit is not assigned to a capability subclass.

U5—Udorthents, mudstone and shale, low base. This unit is on hillsides and ridgetops mostly in the western part of the survey area. The areas have been surface mined for coal and generally consist of a high wall, a bench, and an outslope. The hilltops have been removed from some areas, leaving only an outslope. The benches are gently sloping to strongly sloping and are about 50 to 300 feet wide. The outslopes are moderately steep to very steep, are variable in width, and make up about a third of the acreage of the unit.

The areas of this unit on benches typically have a surface layer about 6 inches thick of brown channery silt loam with dark gray, light reddish brown, and light brown mottles. The next 34 inches is firm, very dark grayish brown channery and very channery silt loam with yellowish brown, red, and dark grayish brown mottles.

Included with this unit in mapping are a few small areas of other types of Udorthents that make up about 25 percent of this map unit.

Available water capacity, permeability, and natural fertility of Udorthents are variable. Runoff is medium to rapid on the benches and very rapid on the high walls and outslopes. Where unlimed, the soils are strongly acid to very strongly acid throughout. The erosion hazard is moderate to severe in unprotected areas.

This unit has limited suitability for farming. A few limed and fertilized areas are used for pasture and hay. The unit has fair potential for woodland and wildlife habitat.

Onsite investigation and testing are necessary to determine the potentials and limitations of this unit for most uses.

This unit is not assigned to a capability subclass.

U6—Udorthents, mudstone and shale, very low base. This unit is mostly on hillsides in the Roaring Creek and Laurel Run watersheds. The areas have been surface mined for coal and mostly consist of a broad bench and an outslope. Some areas have high walls that range from 5 to 15 feet in height. The benches are gently sloping to moderately steep and are about 50 to 400 feet wide. The outslopes are moderately steep to very steep, are variable in width, and make up about 40 percent of the unit.

The areas of this unit on benches typically have a surface layer about 4 inches thick of dark grayish brown channery loam with brownish yellow and reddish yellow mottles. The next 21 inches is firm, grayish brown very channery loam with pockets of clay loam and dark grayish brown, light gray, strong brown, and reddish yellow mottles. The lower 15 inches is friable, grayish brown very channery clay loam that has pockets of fine sandy loam and loam and has reddish yellow mottles.

Included with this unit in mapping are a few areas of other types of Udorthents and a few small wet areas. Included areas make up about 15 percent of this unit.

The available water capacity, permeability, and natural fertility of Udorthents are variable. Runoff is medium to rapid on the benches and very rapid on the outslopes and high walls. Where unlimed, the soils are extremely acid throughout. The erosion hazard is moderate to very severe in unprotected areas.

Onsite investigation and testing are needed to determine the limitations and potential of this unit for most uses.

This unit is not assigned to a capability subclass.

WeC—Weikert shaly silt loam, 3 to 15 percent slopes. This soil is strongly sloping to gently sloping and is well drained. Most areas are on side slopes and ridgetops near Leading Creek.

Typically the surface layer is dark brown shaly silt loam about 6 inches thick. The subsoil is brown very shaly heavy silt loam 6 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 16 inches.

Included with this soil in mapping are a few small areas of well drained Berks soils and moderately well drained Ernest soils. Also included are a few small areas of severely eroded soils and nearly level to moderately steep soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Weikert soil is very low. Permeability is moderately rapid. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is medium acid to very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 10 to 20 inches.

Slope and droughtiness limit this soil for farming, but most areas are used for hay and pasture. A severe erosion hazard in unprotected areas is a major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and seeding of bare areas are the major pasture management needs.

The soil has moderate potential for trees. Only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern, and placing the roads and trails on the contour helps to control this erosion.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVs.

WeD—Weikert shaly silt loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. Most areas are on side slopes and ridgetops near Leading Creek. Drainageways dissect some areas.

Typically the surface layer is dark brown shaly silt loam about 6 inches thick. The subsoil is brown very shaly heavy silt loam 6 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of 16 inches.

Included with this soil in mapping are a few small areas of well drained Berks soils. Also included are a few small areas of severely eroded soils, areas of soils that are less shaly and that have a finer textured subsoil than this Weikert soil, and areas of steep soils. Included soils make up about 15 percent of this unit.

The available water capacity of this Weikert soil is very low. Permeability is moderately rapid. Runoff is rapid, and natural fertility is low. Where unlimed, the soil is medium acid to very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 10 to 20 inches.

Slope and droughtiness limit this soil for farming, but most areas are used for hay and pasture. A severe erosion hazard in unprotected areas is the major management concern. If this soil is cultivated, using minimum tillage, growing crops in contour strips, using a crop sequence that includes hay, maintaining drainageways in sod, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and seeding of bare areas are the major pasture management needs.

This soil has low to moderate potential for trees. A small acreage is wooded. Erosion on logging roads and skid trails is the major management concern, and placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm uses. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IVs.

WeE—Weikert shaly silt loam, 25 to 35 percent slopes. This soil is steep and well drained. Most areas are on side slopes near Leading Creek.

Typically the surface layer is dark brown shaly silt loam about 5 inches thick. The subsoil is brown very shaly silt loam 6 inches thick. The substratum is brown very shaly silt loam that extends to bedrock at a depth of about 16 inches.

Included with this soil in mapping are a few small areas of well drained Berks soils. Also included are a few small areas of severely eroded soils, areas of soils that are less shaly and that have a finer textured subsoil than this Weikert soil, and areas of very steep soils. Included soils make up about 15 percent of this map unit.

The available water capacity of this Weikert soil is very low. Permeability is moderately rapid. Runoff is very rapid, and natural fertility is low. Where unlimed, the soil is medium acid to very strongly acid throughout. The root zone of some types of plants is restricted by bedrock at a depth of 10 to 20 inches.

Slope and droughtiness make this soil generally unsuitable for cultivated crops or hay. The soil is also difficult to manage for pasture, but much of the acreage is pastured. The soil has low to moderate potential for trees, and many areas are wooded. Erosion on logging roads and skid trails is a major management concern. Placing the roads and trails on the contour helps to control this erosion. Slope limits the use of equipment.

Slope and the limited depth to bedrock are the main limitations of this soil for nonfarm use. Maintaining the existing plant cover, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is VIIs.

ZoB—Zoar silt loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. Most areas are on terraces along the Tygart Valley River in the area from Elkwater to the mouth of Leading Creek. Some are along Leading Creek.

Typically the surface layer is dark brown silt loam about 8 inches thick. The subsoil is 30 inches thick. The upper 11 inches is yellowish brown, friable silt loam and firm, sticky silty clay loam. The lower 19 inches is strong brown and yellowish brown, firm, sticky silty clay mottled with light yellowish brown, and light olive gray. The

substratum is gray heavy clay loam to a depth of 60 inches or more.

Included with this soil in mapping are a few small areas of the moderately well drained Monongahela soils, somewhat poorly drained Tygart soils, and soils along Leading Creek that are less than 48 inches deep to bedrock. Also included are a few small areas of soils that have a moderately coarse textured subsoil, severely eroded soils along Georgetown Road, and nearly level to strongly sloping soils. Included soils make up 25 percent of this map unit.

The available water capacity of this Zoar soil is moderate to high. Permeability is slow in the subsoil. Runoff is medium, and natural fertility is low. A seasonal high water table about 1-1/2 to 2-1/2 feet below the surface restricts the root zone of some types of plants. Where unlimed, the soil is strongly acid to very strongly acid throughout. The depth to bedrock is greater than 48 inches.

This soil is suitable for farming and is used mainly for hay and pasture. The hazard of erosion is moderate in unprotected areas and is a management concern. In places diversions help to intercept runoff from higher areas. If this soil is cultivated, cultivating on the contour, using a crop sequence that includes hay, and returning crop residue to the soil help to control erosion and to increase fertility and tilth. The use of proper stocking rates to maintain desirable grasses and legumes, the use of rotational grazing, and deferment of grazing until the soil is reasonably firm are major pasture management needs.

The soil has moderately high potential for trees, but only a small acreage is wooded. Erosion on logging roads and skid trails is a management concern. Placing the roads and trails on the contour helps to control this erosion. The use of equipment is restricted during wet seasons because the soil is soft.

The seasonal high water table, the slow permeability, low strength, and a frost action potential are the main limitations of this soil for nonfarm use. Maintaining the plant cover on construction sites, establishing a plant cover on unprotected areas, and providing for proper surface water disposal help to control erosion and sedimentation.

The capability subclass is IIe.

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; for 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

Frank W. Glover, Jr., State resource conservationist, Soil Conservation Service, assisted with the preparation of this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Soils maps for detailed planning." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Some general principles of management apply throughout the survey to all soils suitable for farm crops and pasture, although the individual soils or groups of soils require different kinds of management.

Most of the soils in the survey area have a moderate or low supply of basic plant nutrients, making the application of lime and fertilizer necessary. The amounts to be applied depend on the type of soil, cropping history, the type of crop grown, the level of desired yield, and tests and analyses of the soil.

The organic matter content is low in most soils, and it is not feasible to build it to a higher level. It is important,

however, to maintain the current level by adding farm manure, by returning crop residue to the soil, and by growing sod crops, cover crops, and green-manure crops.

Tillage tends to break down soil structure and should be kept to the minimum necessary to prepare the seedbed and control weeds. Maintaining the organic matter content of the plow layer also helps to protect the structure.

Artificial drainage is needed in some soils to make them suitable for cultivated crops, hay, and pasture. Soils with a dense, brittle layer or clayey texture in the subsoil are difficult to drain with tile. Such soils generally respond better to open-ditch drainage.

Runoff and erosion occur mainly while a cultivated crop is growing or soon after it has been harvested. All of the gently sloping and steeper soils that are cultivated are subject to erosion and thus require a suitable cropping system for erosion control. The main management needs of such a system include the proper rotation of crops, minimum tillage, mulch planting, using crop residue, growing cover crops and green-manure crops, and using lime and fertilizer. Other major erosion-control practices are contour cultivation, contour stripcropping, diverting runoff, and using grassed waterways. The effectiveness of a particular combination of these measures differs from one soil to another, but different combinations can be equally effective on the same soil.

Using the soil for pasture is effective in controlling erosion in most areas. A high level of pasture management, including fertilization, controlled grazing, and careful selection of pasture mixtures, is needed on some soils to provide enough ground cover to prevent erosion. Grazing is controlled by rotating the livestock from one pasture field to another and providing idle periods for the pasture to allow for regrowth of the plants. Some soils need pasture mixtures that require the least renovation to maintain good ground cover and forage for grazing.

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 slight 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.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Soil maps for detailed planning."

Woodland management and productivity

Lewis Rowan, State woodland conservationist, Soil Conservation Service, assisted with the preparation of this section.

Table 7 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, d, s, f, and r.

In table 7, *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 *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. Listed under *Common trees* are species that woodland managers generally favor in intermediate or improvement cuttings. These species are selected on the basis of growth rate, quality, value, and marketability. Also listed are other tree species that commonly grow on the soil, regardless of their potential value or growth.

Trees to plant are those that are suited to the soils and to commercial wood production.

Recreation

Randolph County has many areas used for camping, hiking, hunting, fishing, sightseeing, and some boating.

Public lands available for recreation include the Monongahela National Forest and Kumbrabow State Forest.

The soils of the survey area are rated in table 8 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. Suitability 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 8, 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 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife habitat

Thomas C. Crebbs, State biologist, Soil Conservation Service, assisted with the preparation of this section.

Randolph County has a large and varied population of fish and wildlife. Black bear, white-tailed deer, wild turkeys, bobcat, and snowshoe hare inhabit the areas at higher elevations. The lower elevations are populated by ruffed grouse, raccoons, squirrels, foxes, rabbits, and a few bobwhite quail. The streams, lakes, and farm ponds in the area provide habitat for a variety of bass and trout, as well as serving as habitat for wood duck and a resting and feeding area for migratory waterfowl.

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 9, 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, and wheatgrass.

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 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, 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, cattail, reed canary grass, 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 in 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, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, muskrat, mink, and beaver.

Engineering

James Dove, State conservation engineer, Soil Conservation Service assisted with the preparation of this section.

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, 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 10 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 11 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 11 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 one or more 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 11 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 11 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 tranches, 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 12 gives information about the soils as a source of roadfill 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 12, 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

James Dove, State conservation engineer, Soil Conservation Service, assisted with the preparation of this section.

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to

overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of 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 14 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 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 larger 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 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 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 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor K is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To

estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor T is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 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 is not considered flooding.

Table 16 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 are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. The extent of flooding based on soil data are less specific than those 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 16 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 16.

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 excavations.

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.

Soil series and 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 (*4*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*5*). 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 "Soil maps for detailed planning."

Atkins series

The Atkins series consists of deep, poorly drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Atkins soils are on flood plains mainly along the Tygart Valley River and Leading Creek and their tributaries. Slopes range from 0 to 3 percent.

Atkins soils are on the landscape with well drained Pope soils, moderately well drained Philo soils, and poorly drained or very poorly drained Blago and Purdy soils. Atkins soils are less sandy than the Pope or Philo soils. They are less clayey than the Blago or Purdy soils.

Typical pedon of Atkins silt loam, in a hayfield at East Daily, east side of the Tygart Valley River:

Ap—0 to 4 inches, dark grayish brown (10YR 4/2) silt loam; few fine brown or dark brown (7.5YR 4/4) mottles; weak fine granular structure; friable; many roots; strongly acid; clear smooth boundary.

A2g—4 to 14 inches, gray (10YR 5/1) heavy loam; many medium brown or dark brown (7.5YR 4/4) mottles; weak thin platy structure and weak fine granular structure; friable; many roots; strongly acid; gradual smooth boundary.

Bg—14 to 48 inches, gray (10YR 5/1) heavy loam; many medium dark reddish brown (5YR 3/3) and brown or dark brown (7.5YR 4/4) mottles; weak medium and coarse subangular blocky structure; very friable; few roots; strongly acid; abrupt smooth boundary.

IIC—48 to 60 inches, mixed gray (10YR 5/1), dark grayish brown (10YR 4/2), and brown or dark brown (7.5YR 4/4) sand and gravel; single grain; loose; strongly acid.

The solum thickness ranges from 30 to 50 inches, and the depth to bedrock ranges from 40 to 60 inches or more. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 1 or 2.

The B horizon has hue of 10YR, value of 5 through 7, and chroma of 1 or 2. It is heavy loam, silt loam, or light silty clay loam. The B horizon has weak, medium or coarse, subangular blocky structure and friable or very friable consistence.

The C horizon has hue of 10YR, value of 4 through 7, and chroma of 1 through 6. It is weakly stratified silt loam, loam, fine sandy loam, or light silty clay loam or is stratified sand and gravel. It has loose to friable consistence.

Belmont series

The Belmont series consists of deep, well drained soils. The soils formed in lime-influenced material weathered mainly from limestone interbedded in some areas with shale, siltstone, and sandstone. The Belmont soils are on ridgetops, benches, and side slopes. Slopes range from 3 to 70 percent but are dominantly 25 to 70 percent.

Belmont soils are on the landscape with well drained Calvin, Calvin high base substratum, Meckesville, and

Shouns soils. Belmont soils are less acid, especially in the lower part of the profile, than any of these soils. They are deeper and contain fewer coarse fragments than the Calvin or Calvin high base substratum soils. Belmont soils do not have the fragipan typical of the Meckesville soils.

Typical pedon of Belmont silt loam in an area of Belmont stony silt loam-Rock outcrop complex, 35 to 70 percent slopes, in a wooded area north of a rock quarry along U.S. Route 250, about 7 miles east of Huttonsville:

A1—0 to 2 inches, dark brown (7.5YR 3/2) silt loam; moderate fine granular structure; very friable; many roots; strongly acid; clear smooth boundary.
A2—2 to 8 inches, brown or dark brown (7.5YR 4/2) silt loam; moderate fine granular structure; friable; many roots; slightly acid; clear smooth boundary.
B21t—8 to 19 inches, reddish brown (5YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm, sticky, slightly plastic; common roots; common clay films on ped faces; 10 percent coarse fragments; slightly acid; gradual wavy boundary.
B22t—19 to 31 inches, reddish brown (5YR 4/4) channery heavy silty clay loam; moderate fine and medium subangular blocky structure; firm, sticky, plastic; few roots; common clay films on ped faces; 15 percent coarse fragments; slightly acid; clear wavy boundary.
C—31 to 42 inches, reddish brown (5YR 4/3) channery clay loam; massive; friable; few roots; 30 percent coarse fragments; neutral; clear wavy boundary.
R—42 inches, gray limestone.

The solum thickness ranges from 24 to 40 inches, and the depth to bedrock ranges from 40 to 50 inches. Coarse fragments of limestone, shale, siltstone, and sandstone make up 0 to 20 percent of the solum and 20 to 60 percent of the C horizon. In unlimed areas the soils are strongly acid to slightly acid in the A horizon and upper part of the B horizon, medium acid to neutral in the lower part of the B horizon, and medium acid to mildly alkaline in the C horizon.

The A horizon has hue of 10YR through 5YR, value of 2 through 5, and chroma of 2 through 4.

The B horizon has hue of 5YR through 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is mainly silty clay loam, clay loam, silt loam, or their channery counterparts but has thin subhorizons of silty clay in some pedons. The B horizon has moderate, fine or medium, subangular blocky structure and firm, slightly sticky or sticky, and slightly plastic or plastic consistence.

The C horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is channery or very channery counterparts of silty clay loam, clay loam, or sandy clay loam. It has friable or firm consistence.

Berks series

The Berks series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded shale, siltstone, and fine-grained sandstone. The Berks soils are on uplands mostly adjacent to flood plains and terraces of the Tygart Valley River and near Leading Creek, Middle Mountain, and Spruce Knob Lake. Slopes range from 3 to 70 percent but are dominantly 35 to 70 percent.

Berks soils are on the landscape with well drained Calvin and Weikert soils and moderately well drained Ernest soils. Berks soils are less red than the Calvin soils and are deeper than the Weikert soils. They are shallower than and do not have the fragipan typical of the Ernest soils.

Typical pedon of Berks channery silt loam, 35 to 70 percent slopes, in a wooded area about 3-1/2 miles northwest of U.S. Route 219, on the east side of Laurel Mountain Road:

O1—3 inches to 1 inch, hardwood leaf litter.
O2—1 inch to 0, black partially decomposed leaf litter.
A1—0 to 3 inches, very dark grayish brown (10YR 3/2) channery silt loam; weak fine granular structure; very friable; many roots; 20 percent coarse fragments; very strongly acid; abrupt wavy boundary.
B1—3 to 7 inches, yellowish brown (10YR 5/4) channery silt loam; weak fine granular structure and weak medium subangular blocky structure; friable; many roots; 20 percent coarse fragments; very strongly acid; clear wavy boundary.
B21—7 to 13 inches, yellowish brown (10YR 5/4) channery silt loam; moderate medium subangular blocky structure; friable; common roots; 20 percent coarse fragments; few discontinuous silt or clay films on ped faces; very strongly acid; clear wavy boundary.
B22—13 to 21 inches, yellowish brown (10YR 5/4) channery silt loam; moderate medium subangular blocky structure; friable; few roots; 40 percent coarse fragments; few discontinuous silt or clay films on ped faces; very strongly acid; clear wavy boundary.
B3—21 to 27 inches, yellowish brown (10YR 5/4) very channery silt loam; weak medium subangular blocky structure; firm; few roots; 70 percent coarse fragments; very strongly acid; clear wavy boundary.
C—27 to 35 inches, yellowish brown (10YR 5/4) very channery silt loam; massive; firm; 85 percent coarse fragments; very strongly acid; clear wavy boundary.
R—35 inches, shale, siltstone, and sandstone.

The solum thickness ranges from 18 to 36 inches, and the depth to bedrock from 20 to 40 inches. Coarse fragments of shale, siltstone, and sandstone make up 15 to 50 percent of the A horizon, 15 to 75 percent of individual subhorizons of the B horizon, and 60 to 90

percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 through 5, and chroma of 1 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. It is channery, very channery, shaly, or very shaly counterparts of silt loam or loam. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable to firm consistence.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. It is very channery or very shaly counterparts of silt loam or loam. It has friable or firm consistence.

Blago series

The Blago series consists of deep, poorly drained or very poorly drained soils that formed in slackwater-deposited alluvial material washed mainly from acid soils on uplands. The Blago soils are on low terraces mainly along the Tygart Valley River and are generally adjacent to uplands. Slopes range from 0 to 3 percent.

Blago soils are on the landscape with somewhat poorly drained Tygart and Tygart Variant soils, poorly drained Atkins soils, and poorly drained or very poorly drained Purdy soils. Blago soils have a darker surface layer than any of these soils and are more clayey than the Tygart Variant or Atkins soils.

Typical pedon of Blago silty clay loam in a pasture about 0.7 mile northwest of Beverly and 200 feet northeast of Route 37/8.

Ap—0 to 9 inches, black (10YR 2/1) silty clay loam; moderate medium granular structure; friable; many roots; very strongly acid; clear smooth boundary.

A1—9 to 16 inches, black (10YR 2/1) silty clay loam; common medium dark gray (10YR 4/1) and brown or dark brown (10YR 4/3) mottles; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; many roots; very strongly acid; clear smooth boundary.

B21tg—16 to 32 inches, dark gray (10YR 4/1) light silty clay; common medium reddish brown (5YR 4/4) mottles; moderate very coarse prismatic structure; friable, sticky, plastic; many roots along faces of prisms; continuous clay films on prism faces; very strongly acid; clear smooth boundary.

B22tg—32 to 45 inches, dark gray (N 4/0) silty clay; many coarse strong brown (7.5YR 5/8) mottles; moderate very coarse prismatic structure; firm, sticky, plastic; common roots along faces of prisms; continuous clay films on prism faces; very strongly acid; clear smooth boundary.

B23tg—45 to 51 inches, gray (N 5/0) silty clay; few medium strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure; firm, sticky, plastic; few roots along faces of prisms; common clay films on prism faces; very strongly acid; clear smooth boundary.

IIC—51 to 72 inches, dark reddish brown (5YR 3/2) heavy clay loam; few fine gray (10YR 5/1) mottles; massive; very firm, slightly sticky, slightly plastic; few roots; strongly acid.

The solum thickness ranges from 40 to 60 inches, and the depth to bedrock is greater than 60 inches. The solum is generally free of gravel, but the gravel content ranges from 0 to 10 percent in the solum and 0 to 30 percent in the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR or is neutral, value of 2 or 3, and chroma of 0 or 1. The A horizon is commonly a few inches thinner in the better drained areas.

The B horizon has hue of 10YR or is neutral, value of 4 or 5, and chroma of 0 through 2. It is silty clay, heavy silty clay loam, or clay. The B horizon has very coarse, prismatic structure and friable or firm, slightly sticky or sticky, slightly plastic or plastic consistence.

The C horizon has hue of 10YR or is neutral, value of 4 through 6, and chroma of 0 or 1; or a hue of 5YR, value of 3 or 4, and chroma of 2 or 3. It is light silty clay loam, clay loam, or their gravelly counterparts. It has friable to very firm, slightly sticky or sticky, slightly plastic or plastic consistence.

Brinkerton Variant

The Brinkerton Variant consists of deep, somewhat poorly drained soils. They formed mainly in acid colluvial material that moved downslope from soils on uplands. The Brinkerton Variant soils are on foot slopes, around stream heads, and in saddles and depressions on uplands mainly at an elevation of more than 3,000 feet. Slopes range from 3 to 15 percent but are dominantly 3 to 8 percent.

Brinkerton Variant soils are on the landscape with well drained Dekalb and Gilpin soils and moderately well drained Buchanan, Cookport Variant, and Ernest soils. Brinkerton Variant soils are deeper than the Dekalb, Gilpin, or Cookport Variant soils and have a fragipan which is not a characteristic of these soils. They have less sand and fewer coarse fragments than the Dekalb soils.

Typical pedon of Brinkerton Variant silt loam in an area of Brinkerton Variant very stony silt loam, 3 to 15 percent slopes, in a wooded area along Route 45, about 200 feet north of Whitman Knob Trail, in Kumbrabow State Forest:

A1—0 to 3 inches, black (10YR 2/1) silt loam; moderate fine granular structure; friable; many roots; very strongly acid; clear wavy boundary.

A2—3 to 7 inches, brown (7.5YR 5/2) silt loam; few gray or light gray (10YR 6/1) mottles; moderate thin platy structure; friable; many roots; very strongly acid; clear wavy boundary.

B21t—7 to 13 inches, strong brown (7.5YR 5/8) silty clay loam; many coarse gray or light gray (10YR 6/1) mottles; grayish brown (10YR 5/2) ped faces; moderate medium prismatic structure; firm; common roots; few discontinuous clay films on ped faces; 5 percent coarse fragments; very strongly acid; clear broken boundary.

B22t—13 to 27 inches, strong brown (7.5YR 5/8) channery silty clay loam; many coarse gray or light gray (10YR 6/1) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; few roots; common discontinuous clay films on ped faces; 20 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx—27 to 42 inches, mixed strong brown (7.5YR 5/8) and brown or dark brown (7.5YR 4/4) shaly silty clay loam; many coarse gray or light gray (10YR 6/1) mottles; weak medium and thick platy structure; very firm, brittle; 25 percent coarse fragments; very strongly acid; gradual wavy boundary.

C—42 to 60 inches, mixed strong brown (7.5YR 5/8), brown or dark brown (7.5YR 4/4), and gray or light gray (10YR 6/1) shaly silty clay loam; massive; very firm; 25 percent coarse fragments; very strongly acid.

The solum thickness ranges from 40 to 50 inches, and the depth to bedrock is generally greater than 60 inches. The depth to the fragipan ranges from 20 to 30 inches. Coarse fragments of shale, siltstone, and sandstone make up 0 to 20 percent of the profile above the fragipan, 5 to 30 percent of the fragipan, and 5 to 45 percent of the C horizon. In unlimed areas the soils are strongly or very strongly acid throughout.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 5, and chroma of 1 through 3.

The B horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 4 through 8. It is heavy silt loam, clay loam, silty clay loam, or their shaly, channery, or gravelly counterparts. The B2t horizon has moderate, medium, prismatic structure or moderate, medium or coarse, subangular blocky structure and friable or firm consistence. The Bx horizon has weak, medium or thick, platy structure or weak, very coarse, prismatic structure parting to platy or subangular blocky. It has very firm consistence.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 through 8. It is silty clay loam, silt loam, loam, or their shaly, channery, or gravelly counterparts. It has firm or very firm consistence.

Buchanan series

The Buchanan series consists of deep, moderately well drained soils that formed in acid colluvial material that moved downslope from soils on uplands. The Buchanan soils are on foot slopes, along drainageways, on benches, and in coves mainly in the southern and western parts of the survey area. Slopes range from 3 to 35 percent but are dominantly 15 to 35 percent.

Buchanan soils are on the landscape with well drained Dekalb and Lily soils, moderately well drained Ernest soils, and somewhat poorly drained Brinkerton Variant soils. Buchanan soils are deeper than the Dekalb or Lily soils and have a fragipan which is not typical in those soils. Buchanan soils are more sandy than the Ernest soils.

Typical pedon of Buchanan loam in a wooded area of Buchanan and Ernest stony soils, 3 to 15 percent slopes, on the north side of U.S. Route 33, about 2 miles northwest of Pumpkintown:

A1—0 to 1 inch, very dark gray (10YR 3/1) loam; moderate medium granular structure; loose; many roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

A2—1 to 5 inches, brown or dark brown (10YR 4/3) loam; moderate medium granular structure; friable; many roots; 5 percent coarse fragments; strongly acid; gradual smooth boundary.

B1—5 to 10 inches, brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; many roots; 10 percent coarse fragments; strongly acid; gradual smooth boundary.

B21t—10 to 17 inches, yellowish brown (10YR 5/4) heavy loam; moderate fine subangular blocky structure; friable; common roots; few discontinuous clay films on ped faces; 10 percent coarse fragments; strongly acid; gradual smooth boundary.

B22t—17 to 26 inches, light yellowish brown (10YR 6/4) channery light clay loam; few fine and medium strong brown (7.5YR 5/6) and light gray (10YR 7/2) mottles; moderate fine subangular blocky structure; friable; few roots; common discontinuous clay films on ped faces; 20 percent coarse fragments; strongly acid; gradual smooth boundary.

Bx1—26 to 42 inches, light yellowish brown (10YR 6/4) channery sandy clay loam; common coarse strong brown (7.5YR 5/6) and light gray (10YR 7/2) mottles; moderate very coarse prismatic structure; very firm and brittle; few discontinuous clay films along prism faces; 30 percent coarse fragments; strongly acid; gradual smooth boundary.

Bx2—42 to 60 inches, light yellowish brown (10YR 6/4) channery sandy clay loam; many coarse strong brown (7.5YR 5/6) and light gray (10YR 7/2) mottles; weak very coarse prismatic structure; very firm and brittle; few discontinuous clay films along prism faces; 40 percent coarse fragments; strongly acid; gradual wavy boundary.

C—60 to 72 inches, light yellowish brown (10YR 6/4) very channery sandy loam; common medium light gray (10YR 7/2) mottles; massive; firm; 50 percent coarse fragments; strongly acid.

The solum thickness ranges from 40 to 60 inches, and the depth to bedrock is generally greater than 60 inches. Coarse fragments of sandstone, siltstone, or shale make up 5 to 30 percent of the profile above the fragipan, 10 to 50 percent of the fragipan, and 40 to 60 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 1 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 through 6. It is loam, sandy clay loam, clay loam, or their channery or gravelly counterparts. The Bt horizon has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence. The Bx horizon has weak or moderate, very coarse, prismatic structure and firm or very firm consistence.

The C horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 1 through 4. It is loam, sandy clay loam, sandy loam, clay loam, or their channery, very channery, gravelly, or very gravelly counterparts. It has firm or very firm consistence.

Calvin series

The Calvin series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded shale, siltstone, and sandstone. The Calvin soils are on ridgetops and side slopes. Slopes range from 3 to 70 percent but are dominantly 25 to 70 percent.

Calvin soils are on the landscape in association with well drained Belmont, Berks, and Dekalb soils. The Calvin soils are shallower than the Belmont soils, contain more coarse fragments, and are more acid, especially in the lower part. Calvin soils are redder than the Berks or Dekalb soils and have less sand than the Dekalb soils.

Typical pedon of Calvin channery silt loam, 35 to 70 percent slopes, in a wooded area about 1 mile west of Valley Head, along Route 15/5, about 1 mile northwest of its junction with Route 15:

A1—0 to 1 inch, dark reddish brown (5YR 2/2) channery silt loam; weak fine granular structure; loose; many roots; 15 percent coarse fragments; very strongly acid; abrupt wavy boundary.

A2—1 to 8 inches, dark reddish gray (5YR 4/2) channery loam; weak medium granular structure; friable; many roots; 15 percent coarse fragments; strongly acid; gradual smooth boundary.

B2—8 to 20 inches, reddish brown (2.5YR 4/4) channery loam; weak fine subangular blocky structure; firm; common roots; 20 percent coarse fragments; strongly acid; gradual wavy boundary.

B3—20 to 27 inches, reddish brown (2.5YR 4/4) channery loam; weak fine subangular blocky structure; friable; few roots; 40 percent coarse fragments; strongly acid; gradual wavy boundary.

C—27 to 34 inches, reddish brown (2.5YR 4/4) very channery loam; massive; friable; few roots; 65 percent coarse fragments; strongly acid; gradual wavy boundary.

R—34 inches, sandstone.

The solum thickness ranges from 20 to 35 inches, and the depth to bedrock from 20 to 40 inches. Coarse fragments of shale, siltstone, and sandstone make up 15 to 25 percent of the A horizon, 20 to 55 percent of individual subhorizons of the B horizon, and 40 to 80 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 5YR or 7.5YR, value of 2 through 4, and chroma of 2 through 4.

The B horizon has hue of 10R through 5YR, value of 3 or 4, and chroma of 2 through 6. It is channery, very channery, shaly, or very shaly counterparts of silt loam, loam, or silty clay loam. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence.

The C horizon has hue of 10R through 5YR, value of 3 or 4, and chroma of 2 through 6. It is channery, very channery, shaly, or very shaly counterparts of silt loam, loam, or silty clay loam. It has friable or firm consistence.

Chavies series

The Chavies series consists of deep, well drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Chavies soils in this survey area are a taxadjunct because the part of the profile that is 50 inches beneath the top of the argillic horizon has lower base saturation than is defined in the range for the series. The soils are on high flood plains of the Middle Fork River and its tributaries. Slopes range from 0 to 3 percent.

Chavies soils are on the landscape with well drained Pope soils and moderately well drained Philo soils. Chavies soils are flooded less frequently than these soils.

Typical pedon of Chavies fine sandy loam in a field about 2.1 miles south of Ellamore, along the Middle Fork River:

Ap—0 to 9 inches, dark brown (10YR 3/3) fine sandy loam; moderate fine granular structure; friable; many roots; very strongly acid; abrupt smooth boundary.

B1—9 to 15 inches, strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; many roots; strongly acid; gradual smooth boundary.

B21t—15 to 24 inches, strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few discontinuous clay films on ped faces; common roots; strongly acid; gradual smooth boundary.

B22t—24 to 36 inches, strong brown (7.5YR 5/6) fine sandy loam; moderate coarse subangular blocky

structure; friable; few discontinuous clay films on ped faces; common roots; strongly acid; gradual smooth boundary.
B3—36 to 50 inches, strong brown (7.5YR 5/6) fine sandy loam; weak coarse subangular blocky structure; friable; common roots; strongly acid; gradual smooth boundary.
C—50 to 60 inches, strong brown (7.5YR 5/6) sandy loam; massive; very friable; strongly acid.

The solum thickness ranges from 30 to 50 inches, and the depth to bedrock is greater than 60 inches. The content of gravel ranges from 0 to 25 percent in the solum and 0 to 30 percent in the C horizon. In unlimed areas the soils are medium acid to very strongly acid throughout.

The A horizon has a hue of 10YR, value of 3 through 5, and chroma of 3 or 4.

The B horizon has hue of 10YR through 5YR, value of 4 or 5, and chroma of 4 through 6. It is loam or fine sandy loam or their gravelly counterpart. The B horizon has weak or moderate, medium or coarse, subangular blocky structure and friable or firm consistence.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. It is loamy sand or sandy loam or their gravelly counterpart. It has loose to friable consistence.

Cookport Variant

The Cookport Variant consists of moderately deep, moderately well drained soils that formed in acid material weathered from interbedded sandstone, siltstone, and shale. The Cookport Variant soils are on broad ridgetops and benches mostly at an elevation where the average annual precipitation exceeds 50 inches. Slopes range from 3 to 15 percent but dominantly are 3 to 8 percent.

Cookport Variant soils are on the landscape with well drained Dekalb, Gilpin, and Lily soils and somewhat poorly drained Brinkerton Variant soils. Cookport Variant soils have less sand and fewer coarse fragments than the Dekalb soil and are shallow and do not have the fragipan typical of the Brinkerton Variant soils.

Typical pedon of Cookport Variant silt loam, 3 to 8 percent slopes, in a wooded area 1.5 miles east of Parting Springs fire tower road, 100 yards west of a strip mine on Route 45:

O1—2 inches to 1/4 inch, hardwood leaf litter.
O2—1/4 inch to 0, black partially decomposed leaf litter.
A1—0 to 3 inches, black (10YR 2/1) silt loam; moderate medium granular structure; very friable; many roots; strongly acid; clear irregular boundary.
A2—3 to 8 inches, brown or dark brown (10YR 4/3) loam; weak medium granular structure; friable; many roots; strongly acid; clear irregular boundary.
B21t—8 to 14 inches, yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable; common roots; few discontinuous clay films on ped faces; 5 percent coarse fragments; strongly acid; gradual wavy boundary.
B22t—14 to 18 inches, yellowish brown (10YR 5/4) clay loam; common medium strong brown (7.5YR 5/8) and reddish gray (5YR 5/2) mottles; weak and moderate fine and medium subangular blocky structure; friable; common roots; common discontinuous clay films on ped faces; 5 percent coarse fragments; strongly acid; clear wavy boundary.
B3—18 to 30 inches, brown (10YR 5/3) clay loam; many medium strong brown (7.5YR 5/8) and olive gray (5Y 5/2) mottles; weak medium prismatic structure; firm; 5 percent coarse fragments; strongly acid; clear smooth boundary.
R—30 inches, fine grained sandstone.

The solum thickness and depth to bedrock range from 20 to 40 inches. Coarse fragments of sandstone, siltstone, and shale make up 0 to 20 percent of the solum and 5 to 40 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 through 6. It is loam, clay loam, or their channery counterparts. The B horizon has weak or moderate, fine or medium, subangular blocky structure or weak, prismatic structure parting to subangular blocky. It has friable or firm consistence. Many pedons have a firm or very firm layer in the lower part of the B horizon which resembles a fragipan.

Some pedons have a C horizon that has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is sandy loam, loam, or their channery counterparts. It has loose to firm consistence.

Dekalb series

The Dekalb series consists of moderately deep, well drained soils that formed in acid material weathered from sandstone and some interbedded siltstone and shale. The Dekalb soils are on ridgetops, benches, and side slopes. Slopes range from 3 to 70 percent. The nonstony map units dominantly have slopes of 8 to 15 percent, and the extremely stony units 35 to 70 percent.

Dekalb soils are on the landscape with well drained Calvin, Calvin high base substratum, Gilpin, Lily, and Leetonia soils; moderately well drained Buchanan and Cookport Variant soils; and somewhat poorly drained Brinkerton Variant soils. The Dekalb soils are less red and have more sand than the Calvin or Calvin high base substratum soils. They have more coarse fragments and more sand than the Gilpin, Lily, or Cookport Variant soils; are shallower than and do not have the fragipan typical of the Buchanan and Brinkerton Variant soils; and are shallower and have less sand than the Leetonia soils.

Typical pedon of Dekalb channery loam, 8 to 15 percent slopes, in wooded area on the east side of Mill Ridge fire trail, 1/2 mile north of Mowery low gap, in Kumbrabow State Forest:

A1—0 to 3 inches, very dark brown (10YR 2/2) channery loam; weak fine granular structure; loose; many roots; 15 percent coarse fragments; very strongly acid; abrupt wavy boundary.
A2—3 to 10 inches, brown or dark brown (10YR 4/3) channery loam; weak fine granular structure; friable; many roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.
B2—10 to 18 inches, yellowish brown (10YR 5/4) channery loam; weak fine subangular blocky structure; friable; common roots; 20 percent coarse fragments; strongly acid; gradual wavy boundary.
B3—18 to 26 inches, yellowish brown (10YR 5/6) very channery loam; very weak fine subangular blocky structure; friable; few roots; 50 percent coarse fragments; strongly acid; gradual wavy boundary.
C—26 to 33 inches, yellowish brown (10YR 5/6) very channery loam; massive; friable; few roots; 90 percent coarse fragments; strongly acid; clear irregular boundary.
R—33 inches, gray and brown sandstone.

The solum thickness and depth to bedrock range from 20 to 40 inches. Coarse fragments dominantly of sandstone and some siltstone and shale make up 15 to 60 percent of individual horizons of the solum and 50 to 90 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 through 6, and chroma of 1 through 4. The A2 horizon is commonly grayer at the higher elevations.

The B horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 8. It is channery or very channery counterparts of loam, fine sandy loam, or sandy loam. The B horizon has weak, fine or medium, subangular blocky structure and friable consistence.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 6. It is very channery loam or very channery sandy loam. It has loose to friable consistence.

Ernest series

The Ernest series consists of deep, moderately well drained soils. The soils formed in acid colluvial material that moved downslope from soils on uplands. Ernest soils are on foot slopes, on alluvial fans, in coves, and along drainageways. Slopes range from 3 to 35 percent but are dominantly 8 to 15 percent.

Ernest soils are on the landscape with well drained Berks, Gilpin, and Weikert soils; moderately well drained Buchanan soils; and somewhat poorly drained Brinkerton Variant soils. Ernest soils are deeper than the Berks, Gilpin, or Weikert soils, and they have a fragipan that is not a characteristic of these soils. Ernest soils have less sand than the Buchanan soils.

Typical pedon of Ernest silt loam, 8 to 15 percent slopes, in white pine grove, 1.5 miles east of Beverly, on Route 37/8:

Ap—0 to 5 inches, dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many roots; 10 percent coarse fragments; very strongly acid; clear wavy boundary.
B1—5 to 7 inches, yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; many roots; 10 percent coarse fragments; very strongly acid; clear wavy boundary.
B21t—7 to 15 inches, pale brown (10YR 6/3) shaly light silty clay loam; moderate fine subangular blocky structure; firm; few roots; common discontinuous clay films on ped faces; 15 percent coarse fragments; very strongly acid; gradual wavy boundary.
B22t—15 to 24 inches, pale brown (10YR 6/3) shaly silty clay loam; common fine and medium yellowish brown (10YR 5/8) and light brownish gray (2.5Y 6/2) mottles; moderate fine and medium subangular blocky structure; firm; few roots; common discontinuous clay films on ped faces; 20 percent coarse fragments; very strongly acid; gradual wavy boundary.
Bx1—24 to 42 inches, yellowish brown (10YR 5/4) shaly silt loam; common medium yellowish brown (10YR 5/8) and light brownish gray (2.5Y 6/2) mottles; moderate very coarse prismatic structure; very firm and brittle; few discontinuous clay films along prism faces; few roots; 30 percent coarse fragments; very strongly acid; gradual wavy boundary.
Bx2—42 to 54 inches, brown (10YR 5/3) shaly silt loam; common medium yellowish brown (10YR 5/8) and light brownish gray (2.5Y 6/2) mottles; moderate very coarse prismatic structure; very firm and brittle; 35 percent coarse fragments; very strongly acid; gradual wavy boundary.
C—54 to 74 inches, brown (10YR 5/3) very shaly silt loam; massive; very firm; 50 percent coarse fragments; very strongly acid.

The solum thickness ranges from 40 to 55 inches, and the depth to bedrock is generally greater than 60 inches. Coarse fragments of shale, siltstone, and sandstone make up 5 to 25 percent of the profile above the fragipan, 10 to 40 percent of the fragipan, and 10 to 50 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 through 8. It is silt loam, silty clay loam, or their shaly or channery counterparts. The Bt

horizon has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence. The Bx horizon has weak or moderate, very coarse, prismatic structure parting to subangular blocky and has firm or very firm consistence.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 2 through 4. It is silt loam, silty clay loam, or their shaly or channery counterparts. It has firm or very firm consistence.

Fluvaquents

Fluvaquents consist of moderately deep and deep, somewhat poorly drained soils that formed in acid alluvial material washed from soils on uplands. The soils are on flood plains mostly at an elevation of more than 3,000 feet. Slopes range from 0 to 3 percent.

Fluvaquents are on the landscape with Brinkerton Variant, Buchanan, and Ernest soils. Fluvaquents are more poorly drained than any of these soils, and they are subject to flooding.

Because of the variability of Fluvaquents, a typical pedon is not given. The depth to bedrock ranges from 20 inches to more than 60 inches. Coarse fragments make up 0 to 10 percent of the surface layer and 0 to 40 percent of the underlying layers. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, 7.5YR, or 2.5Y; value of 3 through 5; and chroma of 1 through 4. It is silt loam, loam, or fine sandy loam.

The underlying horizons have hue of 10YR, 7.5YR, or 2.5Y; value of 4 through 7; and chroma of 1 through 4. They are silt loam, loam, fine sandy loam, sandy clay loam, clay loam, or silty clay loam. Structure ranges from weak, medium and coarse, subangular blocky to massive. Consistence is friable or very friable.

Gilpin series

The Gilpin series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded shale, siltstone, and sandstone. The Gilpin soils are on ridgetops, benches, and side slopes. Slopes range from 3 to 70 percent but are dominantly 3 to 15 percent.

Gilpin soils are on the landscape with well drained Dekalb and Lily soils, moderately well drained Cookport Variant and Ernest soils, and somewhat poorly drained Brinkerton Variant soils. Gilpin soils have less sand than the Dekalb or Lily soils and fewer coarse fragments than the Dekalb soils. Gilpin soils are shallower than and do not have the fragipan of the Ernest and Brinkerton Variant soils.

Typical pedon of Gilpin channery silt loam, 3 to 15 percent slopes, in a wooded area, along a strip mine road 1.5 miles west of Norton, 200 yards west of U.S. Route 33:

A1—0 to 1 inch, black (10YR 2/1) channery silt loam; moderate medium granular structure; friable; many roots; 15 percent coarse fragments; strongly acid; abrupt smooth boundary.

A2—1 to 5 inches, dark grayish brown (10YR 4/2) channery silt loam; moderate medium granular structure; friable; many roots; 15 percent coarse fragments; strongly acid; clear smooth boundary.

B1—5 to 8 inches, yellowish brown (10YR 5/8) silt loam; weak fine subangular blocky structure; friable; many roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

B21t—8 to 16 inches, yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm; many roots; continuous clay films on ped faces; 5 percent coarse fragments; strongly acid; gradual smooth boundary.

B22t—16 to 21 inches, yellowish brown (10YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; firm; common roots; continuous clay films on ped faces; 25 percent coarse fragments; strongly acid; gradual smooth boundary.

C—21 to 26 inches, yellowish brown (10YR 5/6) very channery silty clay loam; massive; firm; few roots; 85 percent coarse fragments; few discontinuous clay films on fragments; strongly acid; clear irregular boundary.

R—26 inches, siltstone.

The solum thickness ranges from 20 to 36 inches, and the depth to bedrock 20 to 40 inches. Coarse fragments of shale, siltstone, and sandstone make up 5 to 40 percent of individual horizons of the solum and 40 to 90 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 through 5, and chroma of 1 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 8. It is silt loam, silty clay loam, or their shaly or channery counterparts. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable to firm consistence. Some pedons have a B3 horizon above bedrock.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 8. It is shaly, very shaly, channery, or very channery counterparts of silt loam, loam, or silty clay loam. It has firm consistence.

Kanawha series

The Kanawha series consists of deep, well drained soils that formed in alluvial material washed from acid and lime-influenced soils on uplands. The Kanawha soils in this survey area are a taxadjunct because the part of the profile that is 50 inches beneath the top of the argillic horizon has lower base saturation than is defined in the range for the series. The Kanawha soils are on

high flood plains mostly along the Tygart Valley River, but some areas are along Dry Fork and Shavers Fork. Slopes range from 0 to 3 percent.

Kanawha soils are on the landscape with well drained Kanawha Variant, Linden, and Pope soils and moderately well drained Philo Variant soils. Kanawha soils are less gravelly and have a thicker solum than the Kanawha Variant soils. They are less sandy and are flooded less frequently than the Linden or Pope soils.

Typical pedon of Kanawha loam in a hayfield along Bell Crouch Road, near Elkwater, east of U.S. Route 219 and about halfway between the highway and the Tygart Valley River:

Ap—0 to 9 inches, brown or dark brown (7.5YR 4/4) loam; moderate fine granular structure; friable; many roots; medium acid; abrupt smooth boundary.
B21t—9 to 24 inches, reddish brown (5YR 4/4) light clay loam; moderate fine subangular blocky structure; firm; common roots; few discontinuous clay films on ped faces and in pores; strongly acid; gradual smooth boundary.
B22t—24 to 45 inches, reddish brown (5YR 4/4) heavy loam; weak fine subangular blocky structure; friable; few roots; few discontinuous clay films on ped faces; strongly acid; gradual smooth boundary.
C—45 to 72 inches, brown or dark brown (7.5YR 4/4) loamy sand; massive and single grain; friable and loose; strongly acid.

The solum thickness ranges from 40 to 50 inches, and the depth to bedrock is generally greater than 60 inches. The content of gravel ranges from 0 to 15 percent in individual horizons of the solum. In unlimed areas the soils are medium acid or strongly acid throughout.

The Ap horizon has hue of 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The B horizon has hue of 5YR through 10YR, value of 4 or 5, and chroma of 4 through 6. It is loam and light clay loam and in places contains thin subhorizons of fine sandy loam. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable to firm consistence.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. It is loamy sand, fine sandy loam, or their gravelly counterpart. It has loose to friable consistence.

Kanawha Variant

The Kanawha Variant consists of deep, well drained soils that formed in alluvial material washed from acid and lime-influenced soils on uplands. The Kanawha Variant soils are on high flood plains mostly along the Tygart Valley River, but some areas are along Dry Fork and Shavers Fork. Slopes range from 0 to 3 percent.

Kanawha Variant soils are on the landscape with well drained Kanawha, Linden, and Pope Variant soils and Udifluvents. Kanawha Variant soils are more gravelly and have a thinner solum than the Kanawha soils, and they are flooded less frequently than the Linden or Pope Variant soils or Udifluvents. Kanawha Variant soils have less sand and more gravel in the upper part than the Linden soils. They are less gravelly and less cobbly than the Pope Variant soils or Udifluvents.

Typical pedon of Kanawha Variant gravelly loam, in a cultivated field along the Tygart Valley River, about 1,000 feet west of U.S. Route 219, near Elkwater Fork:

Ap—0 to 9 inches, dark reddish brown (5YR 3/3) gravelly loam; moderate medium subangular blocky structure; friable; common roots; 20 percent gravel; neutral; clear wavy boundary.
B21t—9 to 15 inches, weak red (2.5YR 4/2) gravelly silt loam; moderate medium subangular blocky structure; few discontinuous clay films on ped faces; firm; common roots; 15 percent gravel; medium acid; clear wavy boundary.
B22t—15 to 21 inches, reddish brown (5YR 4/3) gravelly silt loam; moderate coarse and medium subangular blocky structure; firm; few discontinuous clay films on ped faces and gravel; 25 percent gravel; strongly acid; clear wavy boundary.
B3—21 to 33 inches, reddish brown (5YR 4/4) very gravelly silt loam; pockets of very gravelly sandy loam; weak and moderate medium subangular blocky structure; very friable; 70 percent gravel; few discontinuous clay films on gravel; strongly acid; gradual wavy boundary.
C—33 to 60 inches, reddish brown (5YR 4/4) very gravelly silt loam; pockets of sandy loam and very gravelly sandy loam; massive; very friable or loose; 85 percent gravel; strongly acid.

The solum thickness ranges from 24 to 40 inches, and the depth to bedrock is generally greater than 60 inches. The content of gravel ranges from 15 to 35 percent in the upper part of the solum and 35 to 80 in the lower part. In unlimed areas the soils are medium acid to strongly acid throughout.

The Ap horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4.

The B2t horizon has hue of 7.5YR through 2.5YR, value of 4 or 5, and chroma of 2 through 4. It is gravelly counterparts of silt loam, loam, or sandy clay loam. The B horizon has weak or moderate, medium or coarse, subangular blocky structure. It has firm to very friable consistence.

The C horizon has hue of 7.5YR through 2.5YR, value of 4 or 5, and chroma of 2 through 4. It is very gravelly counterparts of sandy loam, silt loam, or loam. It has loose to friable consistence.

Leetonia series

The Leetonia series consists of deep, well drained to excessively drained soils that formed in acid material

weathered from sandstone. The Leetonia soils in this survey area are a taxadjunct because they have a slightly lower pyrophosphate-extractable iron plus aluminum to clay ratio than is required for a spodic horizon, and they have thin subhorizons of sandy loam. The Leetonia soils are mostly near Cheat Mountain, Shavers Mountain, and Dolly Sods at an elevation where the average annual precipitation exceeds 50 inches. Slope ranges from 3 to 45 percent but is dominantly 8 to 15 percent.

Leetonia soils are on the landscape with well drained Dekalb soils. The Leetonia soils are deeper and have more sand than the Dekalb soils.

Typical pedon of Leetonia rubbly loamy sand, 3 to 25 percent slopes, in a red spruce stand about 0.7 mile north of Gaudineer Knob, west of the Forest Service road:

O1—3 inches to 1 inch, partially decomposed leaves, spruce needles, twigs, and moss.
O2—1 inch to 0, black partially decomposed fibrous mat of organic matter.
A1—0 to 3 inches, black (10YR 2/1) channery sandy loam; weak very fine granular structure; very friable; many roots; 15 percent coarse fragments; very strongly acid; abrupt wavy boundary.
A2—3 to 11 inches, gray (5YR 6/1) channery loamy sand; weak medium granular structure; friable; few roots; 15 percent coarse fragments; extremely acid; abrupt wavy boundary.
B21h—11 to 15 inches, dark reddish brown (5YR 2/2) sandy loam; dark reddish gray (5YR 4/2) and yellowish red (5YR 5/8) stains and streaks; weak medium granular structure; friable; few roots; 10 percent coarse fragments; extremely acid; clear wavy boundary.
B22—15 to 23 inches, strong brown (7.5YR 5/6) very channery sandy loam and loamy sand; weak fine subangular blocky structure; loose; few roots; 50 percent coarse fragments; extremely acid; gradual wavy boundary.
C—23 to 41 inches, brownish yellow (10YR 6/6) very channery loamy sand; single grain; loose; 80 percent coarse fragments; extremely acid; clear wavy boundary.
R—41 inches, sandstone.

The solum thickness ranges from 17 to 42 inches, and the depth to bedrock 40 to 48 inches. Coarse fragments of sandstone make up 15 to 80 percent of individual subhorizons of the solum and 50 to 90 percent of the C horizon. In some areas coarse fragments greater than 10 inches across are throughout the profile. In unlimed areas the soils are very strongly acid or extremely acid throughout.

The A1 horizon is neutral (N) or has hue of 10YR or 7.5YR; value is 2 or 3, and chroma is 2 through 0. The A2 horizon is neutral (N) or has hue of 10YR through 5YR; value is 4 through 6, and chroma is 1 or 0.

The B21h horizon has hue of 5YR through 10YR, value of 2 through 4, and chroma of 2 through 6. It is sandy loam, loamy sand, or their channery or very channery counterparts. It has weak granular or weak subangular blocky structure and friable or very friable consistence. A thin, brittle Bir horizon is in some pedons. The B22 horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 4 through 6. It is loamy sand, sandy loam or their channery or very channery counterparts. It has weak, very fine to medium, subangular blocky structure and loose to friable consistence.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 through 6. It is very channery counterparts of loamy sand, sand, or fine sandy loam. It has loose to friable consistence.

Lily series

The Lily series consists of moderately deep, well drained soils that formed in acid material weathered from sandstone and some interbedded siltstone and shale. The Lily soils are on ridgetops and benches mostly in the western part of the survey area. Slopes range from 3 to 15 percent.

Lily soils are on the landscape with well drained Dekalb and Gilpin soils and moderately well drained Cookport Variant and Buchanan soils. The Lily soils contain less sand and fewer coarse fragments than the Dekalb soils and more sand than the Gilpin soils. They are less deep and do not have the fragipan of the Buchanan soils.

Typical pedon of Lily loam, 3 to 8 percent slopes, in a bushy area 0.6 mile east of the Sinks of Gandy, at Osceola:

A1—0 to 2 inches, black (10YR 2/1) loam; moderate medium granular structure; loose; many roots; strongly acid; abrupt smooth boundary.
A2—2 to 6 inches, brown or dark brown (10YR 4/3) sandy loam; moderate medium granular structure; friable; many roots; strongly acid; clear smooth boundary.
A3—6 to 13 inches, brown (10YR 5/3) sandy loam; moderate medium granular structure; friable; many roots; strongly acid; clear smooth boundary.
B21t—13 to 24 inches, yellowish brown (10YR 5/6) clay loam; weak fine subangular blocky structure; firm; common roots; 10 percent coarse fragments; few discontinuous clay films on ped faces and in pores; strongly acid; gradual smooth boundary.
B22t—24 to 39 inches, yellowish brown (10YR 5/6) channery clay loam; weak and moderate fine subangular blocky structure; firm; 20 percent sandstone fragments; few discontinuous clay films on ped faces and in pores; strongly acid; abrupt smooth boundary.
R—39 inches, sandstone.

The solum thickness and depth to bedrock range from 20 to 40 inches. Coarse fragments dominantly of sandstone and some siltstone and shale make up 0 to 20 percent of individual horizons of the solum. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 through 6, and chroma of 2 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 4 through 6. It is loam, clay loam, or sandy clay loam or channery counterparts of these textures in the lower part. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable to firm consistence.

The C horizon has hue of 10YR through 5YR, value of 5 or 6, and chroma of 4 through 6. It is loam, sandy loam, or their channery counterparts. It has friable or firm consistence.

Linden series

The Linden series consists of deep, well drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Linden soils are on flood plains mainly along the Tygart Valley River south of Huttonsville and in the Dry Fork drainage area. Slopes range from 0 to 3 percent.

Linden soils are on the landscape with well drained Kanawha, Kanawha Variant, Pope, and Pope Variant soils and moderately well drained Philo soils. Linden soils are more sandy and flood more frequently than the Kanawah soils. They are more sandy and less gravelly in the upper part and flood more frequently than the Kanawha Variant soils. They are redder than Pope soils and contain less gravel than the Pope Variant soils.

Typical pedon of Linden fine sandy loam in an area of Pope and Linden fine sandy loams, in a hayfield 300 feet east of the south end of the bridge on U.S. Route 250, at Huttonsville:

Ap—0 to 11 inches, dark reddish brown (5YR 3/3) fine sandy loam; moderate fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.
B2—11 to 20 inches, dark reddish brown (5YR 3/4) fine sandy loam; weak fine subangular blocky structure; friable; common roots; strongly acid; gradual smooth boundary.
B3—20 to 26 inches, dark reddish brown (5YR 3/4) sandy loam; very weak fine subangular blocky structure; friable; few roots; strongly acid; clear smooth boundary.
C1—26 to 45 inches, dark reddish brown (5YR 3/3) loamy sand; massive; loose; medium acid; clear smooth boundary.
C2—45 to 60 inches, dark reddish brown (5YR 3/4) very gravelly loamy sand; massive; loose; medium acid.

The solum thickness ranges from 24 to 48 inches, and the depth to bedrock is generally greater than 60 inches. In unlimed areas the soils are strongly acid or medium acid throughout.

The Ap horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 5YR or 2.5YR, value of 3 through 5, and chroma of 3 or 4. It is fine sandy loam, sandy loam, silt loam, loam, or their gravelly counterparts. The B horizon has weak, fine and medium, subangular blocky structure and friable or firm consistence.

The C horizon has hue of 5YR or 2.5YR, value of 3 through 5, and chroma of 3 or 4. It is loamy sand, sandy loam, or their gravelly counterparts. It has loose or very friable consistence.

Meckesville series

The Meckesville series consists of deep, well drained soils that formed mainly in acid and lime-influenced colluvial material that moved downslope from soils on uplands. The Meckesville soils are on foot slopes, on benches, along drainageways, and in coves. The soils are dominantly above the Greenbrier Limestone throughout the survey area. Slopes range from 3 to 35 percent but are dominantly 15 to 35 percent.

Meckesville soils are on the landscape with well drained Belmont, Calvin high base substratum, and Shouns soils. Meckesville soils have a fragipan not characteristic of these soils. They are more acid, especially in the lower part, than the Belmont soils and are deeper than the Calvin high base substratum soils.

Typical pedon of Meckesville stony silt loam, 15 to 35 percent slopes, in a wooded area along a Forest Service road, about 1.5 miles northeast of U.S. Route 250, and about 7 miles southeast of Huttonsville:

O1—2 inches to 1 inch, leaf litter.
O2—1 inch to 0, black fibrous organic matter.
A1—0 to 3 inches, dark reddish gray (5YR 4/2) silt loam; weak fine granular structure; very friable; many roots; 5 percent coarse fragments; strongly acid; abrupt wavy boundary.
B1—3 to 8 inches, reddish brown (5YR 4/3) heavy silt loam; weak fine subangular blocky structure; very friable; many roots; 10 percent coarse fragments; strongly acid; abrupt wavy boundary.
B21t—8 to 20 inches, reddish brown (5YR 4/4) gravelly silty clay loam; weak medium subangular blocky structure; firm; common roots; few discontinuous clay films on ped faces; 20 percent coarse fragments; strongly acid; clear wavy boundary.
B22t—20 to 29 inches, reddish brown (5YR 4/4) gravelly silty clay loam; moderate medium subangular blocky structure; firm; few roots; common discontinuous clay films on ped faces; 15 percent coarse fragments; strongly acid; clear wavy boundary.
Bx1—29 to 39 inches, dark reddish brown (2.5YR 3/4) gravelly heavy loam; weak very coarse prismatic

structure parting to weak thick platy; firm and brittle; common discontinuous clay films on prism faces; 20 percent coarse fragments; strongly acid; gradual wavy boundary.

Bx2—39 to 48 inches, dark reddish brown (2.5YR 3/4) gravelly silt loam; common medium reddish brown (5YR 4/4) mottles; weak very coarse prismatic structure parting to weak thick platy; very firm and brittle; few discontinuous clay films on prism faces; common medium black coatings; 40 percent coarse fragments; strongly acid; gradual wavy boundary.

C—48 to 60 inches, dark reddish brown (2.5YR 3/4) very gravelly loam; massive; very firm; 75 percent coarse fragments; strongly acid.

The solum thickness ranges from 40 to 80 inches, and the depth to bedrock is generally greater than 60 inches. Coarse fragments of shale, siltstone, and sandstone make up 10 to 30 percent of the profile above the fragipan, 10 to 50 percent of the fragipan, and 20 to 80 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The A horizon has hue of 5YR or 7.5YR, value of 2 through 4, and chroma of 2 through 4.

The part of the B horizon above the Bx horizon has hue of 5YR through 10R, value of 3 through 5, and chroma of 3 through 6. It is silt loam, silty clay loam, loam, clay loam, or their gravelly, channery, or shaly counterparts. It has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence. The Bx horizon has hue of 5YR through 10R, value of 3 or 4, and chroma of 3 or 4. It is silt loam, silty clay loam, loam, clay loam, or their gravelly, channery, or shaly counterparts. It has weak, very coarse, prismatic structure parting to platy or subangular blocky structure and has firm or very firm and brittle consistence.

The C horizon has hue of 10R through 5YR, value of 3 or 4, and chroma of 3 through 6. It is gravelly, very gravelly, channery, or very channery counterparts of loam, silt loam, clay loam, or silty clay loam. It has firm or very firm consistence.

Medihemists

Medihemists are very poorly drained soils that formed in organic material. The organic material consists of poorly decomposed remains of herbaceous and woody plants. The soils are in depressions on broad mountaintops in the Dolly Sods part of the survey area. Slopes are generally less than 1 percent.

Medihemists are on the landscape with Brinkerton Variant and Ernest soils, both of which are mineral soils. Medihemists are more poorly drained than either of these soils.

A typical pedon is not described because the proportion of hemic and sapric materials in Medihemists is variable.

The surface layer in many places is black muck 10 inches thick. In some places it is black mucky peat.

The subsurface layer is dominantly brown mucky peat about 28 inches thick. In some places it contains thin layers of black muck.

Gray heavy silty clay loam or silty clay is at a depth of about 40 inches.

The solum thickness and depth to mineral soil material range from about 18 to 50 inches. Bedrock is at a depth of more than 40 inches. Rock fragments and wood fragments are absent in the solum. In unlimed areas the soils are very strongly acid or extremely acid throughout.

Monongahela series

The Monongahela series consists of deep, moderately well drained soils that formed in old alluvial material washed mainly from acid soils on uplands. The Monongahela soils are on high terraces mainly along the Tygart Valley River and Leading Creek. Slopes range from 0 to 15 percent but are dominantly 3 to 8 percent.

Monongahela soils are on the landscape with moderately well drained Zoar soils and somewhat poorly drained Tygart and Tygart Variant soils. Monongahela soils have a fragipan that is not characteristic of these soils, and they are less clayey than the Zoar or Tygart soils.

Typical pedon of Monongahela silt loam, 3 to 8 percent slopes, in a hayfield 2.7 miles east of Beverly, 100 feet north of the church on the northern boundary of the Randolph County 4-H Camp:

Ap—0 to 7 inches, dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

B1—7 to 12 inches, yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; common roots; slightly acid; clear smooth boundary.

B2t—12 to 22 inches, yellowish brown (10YR 5/6) silt loam; weak to moderate fine subangular blocky structure; friable; common roots; common discontinuous clay films on ped faces; medium acid; clear wavy boundary.

Bx1—22 to 31 inches, yellowish brown (10YR 5/4) loam; common fine yellowish brown (10YR 5/8) and light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure parting to weak thick platy; firm; few discontinuous clay films on prism faces; very strongly acid; clear irregular boundary.

Bx2—31 to 42 inches, light yellowish brown (10YR 6/4) loam; many medium yellowish brown (10YR 5/8) and light brownish gray (2.5Y 6/2) mottles; weak very coarse prismatic structure parting to weak thick platy; very firm, brittle; few discontinuous clay films on prism faces; very strongly acid; clear wavy boundary.

Bx3—42 to 52 inches, light yellowish brown (10YR 6/4) cobbly loam; many yellowish brown (10YR 5/8) and

light brownish gray (2.5Y 6/2) mottles; weak very coarse prismatic structure parting to weak thick platy; very firm, brittle; many fine pores; few discontinuous clay films on prism faces; 25 percent rounded sandstone fragments 4 to 12 inches in diameter; very strongly acid; clear wavy boundary.

C—52 to 60 inches, mixed strong brown (7.5YR 5/8) and light gray (N 7/0) cobbly clay loam; pale yellow (2.5Y 7/4) crushed; massive; firm; 35 percent weathered shale, sandstone fragments, and cobblestones; very strongly acid.

The solum thickness ranges from 40 to 60 inches, and the depth to bedrock is generally greater than 60 inches. Rounded coarse fragments of sandstone and shale make up 0 to 15 percent of the profile above the fragipan, 0 to 25 percent of the fragipan, and 10 to 40 percent of the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B2t horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 4 through 8. It is silt loam, loam, light silty clay loam, clay loam, or sandy clay loam. The B2t horizon has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence. The Bx horizon has hue of 10YR through 2.5Y, value of 5 or 6, and chroma of 2 through 6. It is loam, silt loam, sandy clay loam, clay loam, or their gravelly or cobbly counterparts. The Bx horizon has weak or moderate, very coarse, prismatic structure parting to platy or subangular blocky structure and has firm or very firm consistence.

The C horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 2 through 8. It is sandy loam, loam, clay loam, or their gravelly or cobbly counterparts. It has firm consistence.

Philo series

The Philo series consists of deep, moderately well drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Philo soils are on flood plains mainly along the Tygart Valley River, Leading Creek, and their tributaries. Slopes range from 0 to 3 percent.

Philo soils are on the landscape with well drained Chavies, Linden, and Pope soils and the poorly drained Atkins soils. Philo soils flood more frequently than Chavies soils, are less red than Linden soils, and are more sandy than Atkins soils.

Typical pedon of Philo loam in hayfield east of Tygart Valley River, near East Dailey:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) loam; moderate fine granular structure; friable; many roots; neutral; abrupt smooth boundary.

B1—9 to 15 inches, dark yellowish brown (10YR 3/4) loam; moderate fine granular structure; friable; many roots; strongly acid; gradual smooth boundary.

B2—15 to 24 inches, brown or dark brown (7.5YR 4/4) loam; common fine dark grayish brown (10YR 4/2) mottles; weak very fine subangular blocky structure; friable; common roots; strongly acid; gradual smooth boundary.

C—24 to 60 inches, mixed gray (10YR 6/1) and brown (7.5YR 4/4) fine sandy loam; massive; friable to very friable; few roots; strongly acid.

The solum thickness ranges from 20 to 40 inches, and the depth to bedrock is greater than 48 inches. The gravel content ranges from 0 to 20 percent in the solum and 0 to 40 percent in the C horizon. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of mainly 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 3 or 4. It is loam, fine sandy loam, silt loam, or their gravelly counterparts. The B horizon has moderate, fine granular structure to weak, very fine, subangular blocky structure and friable consistence.

The C horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 1 through 4. It is fine sandy loam, gravelly fine sandy loam, or stratified sand and gravel. It has friable or very friable consistence.

Philo Variant

The Philo Variant consists of deep, moderately well drained soils that formed in alluvial material washed from acid and lime-influenced soils on uplands. The Philo Variant soils are on high flood plains along the Tygart Valley River. Slopes range from 0 to 3 percent.

Philo Variant soils are on the landscape with well drained Kanawha soils and somewhat poorly drained Tygart Variant soils.

Typical pedon of Philo Variant silt loam, in a hayfield south of Route 37/8, about 0.3 mile west of Beverly:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

B21t—8 to 19 inches, reddish brown (5YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common roots; few discontinuous clay films on ped faces; strongly acid; gradual smooth boundary.

B22t—19 to 23 inches, brown (7.5YR 5/4) silty clay loam; few fine pinkish gray (5YR 6/2) mottles; moderate fine subangular blocky structure; firm; common roots; common discontinuous clay films on ped faces; few black films; strongly acid; gradual smooth boundary.

B3—23 to 40 inches, mixed pinkish gray (5YR 6/2) and brown or dark brown (7.5YR 4/4) silty clay loam;

weak fine subangular blocky structure; firm; few roots; common black films and concretions; strongly acid; clear smooth boundary.
C—40 to 60 inches, brown or dark brown (7.5YR 4/4) and light gray or gray (5YR 6/1) fine sandy loam; massive; friable; strongly acid.

The solum thickness ranges from 30 to 45 inches, and the depth to bedrock is generally greater than 60 inches. The gravel content ranges from 0 to 10 percent in the solum and 0 to 40 percent in the C horizon. In unlimed areas the soils are strongly acid or medium acid throughout.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 5YR or 7.5YR, value of 4 through 6, and chroma of 2 through 4. It is silty clay loam, silt loam, or clay loam. The B horizon has weak or moderate, fine or medium, subangular blocky structure and friable or firm consistence.

The C horizon has hue of 5YR or 7.5YR, value of 4 through 6, and chroma of 1 through 4. It is fine sandy loam, silt loam, or their gravelly counterparts. It has friable consistence.

Pope series

The Pope series consists of deep, well drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Pope soils are on flood plains mainly along the major drainage areas. Slopes range from 0 to 3 percent.

Pope soils are on the landscape with well drained Chavies, Kanawha, Linden, and Pope Variant soils; moderately well drained Philo soils; and poorly drained Atkins soils. Pope soils are flooded more frequently than Kanawha or Chavies soils, are more sandy than Kanawha soils, are less red than Linden soils, contain less gravel than Pope Variant soils, and contain more sand than Atkins soils.

Typical pedon of Pope fine sandy loam, in an area of Pope and Linden fine sandy loams, in a pasture about 150 yards south of the bridge between East Daily and Daily:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many roots; very strongly acid; abrupt smooth boundary.
B21—8 to 13 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; many roots; very strongly acid; clear wavy boundary.
B22—13 to 30 inches, brown or dark brown (7.5YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; common roots; extremely acid; clear wavy boundary.
B3—30 to 42 inches, brown (10YR 5/3) fine sandy loam; few fine pinkish gray (7.5YR 6/2) mottles; weak fine and medium subangular blocky structure; friable; common roots; extremely acid; clear wavy boundary.
C—42 to 54 inches, brown (10YR 4/3) loam; pockets of loamy sand and few fine pinkish gray (7.5YR 6/2) mottles; massive; loose; few roots; very strongly acid; clear wavy boundary.
IIC—54 to 60 inches, brown (7.5YR 5/2) stratified sand and gravel; single grain; loose very strongly acid.

The solum thickness ranges from 30 to 45 inches, and the depth to bedrock is generally greater than 60 inches. The content of gravel ranges from 0 to 30 percent in the solum and 0 to 40 percent in the C horizon. In unlimed areas the soils are strongly acid to extremely acid throughout.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is fine sandy loam, sandy loam, silt loam, loam, or their gravelly counterparts. The B horizon has weak, fine or medium, subangular blocky structure and friable or very friable consistence.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is loam, sandy loam, loamy sand, or their gravelly counterparts and is stratified in places. It has very friable or loose consistence.

Pope Variant

The Pope Variant consists of well drained or somewhat excessively drained soils that formed in alluvial material washed mainly from acid and lime-influenced soils on uplands. Pope Variant soils are on flood plains mainly along the upper reaches of the Tygart Valley River and Dry Fork and their tributaries. Slopes range from 0 to 3 percent.

Pope Variant soils are on the landscape with well drained Kanawha Variant, Linden, and Pope soils and Udifluvents. Pope Variant soils are flooded more frequently and contain more gravel than Kanawha Variant soils. They are more gravelly than Linden or Pope soils and are less cobbly than Udifluvents.

Typical pedon of Pope Variant gravelly sandy loam, in a hayfield, 600 feet north of the bridge at the entrance to the Huttonsville Correctional Center:

Ap1—0 to 3 inches, dark grayish brown (10YR 4/2) gravelly sandy loam; moderate medium and coarse granular structure; very friable; many roots; 15 percent gravel; moderately alkaline; gradual wavy boundary.
Ap2—3 to 9 inches, dark brown (10YR 4/3) gravelly sandy loam; pockets of loamy sand; weak medium and coarse granular structure; friable; many roots; 25 percent gravel; neutral; abrupt wavy boundary.
IIC1—9 to 26 inches, dark yellowish brown (10YR 4/4) very gravelly coarse loamy sand and sand; single grain; friable and loose; common roots; 75 percent

gravel; neutral; common films of silt on gravel; diffuse wavy boundary.

IIC2—26 to 60 inches, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) very gravelly coarse sand; single grain; loose; few roots; 90 percent gravel; neutral.

The solum thickness ranges from 8 to 24 inches, and the depth to bedrock is generally greater than 60 inches. The gravel content ranges from 15 to 30 percent in the A horizon, 40 to 80 percent in the B horizon, and 60 to 90 percent in the C horizon. In unlimed areas the soils are strongly acid to neutral throughout.

The Ap horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 through 4.

The C horizon has hue of 10YR through 5YR, value of 4 or 5, and chroma of 3 or 4. It is gravelly or very gravelly counterparts of loamy sand or sand. Some pedons have a B horizon with hue, value, and chroma similar to those of the C horizon. The B horizon is gravelly or very gravelly loamy sand and contains thin subhorizons of sandy loam. It has weak, fine or very fine, subangular blocky structure and friable to loose consistence. The C horizon has loose to very friable consistence.

Purdy series

The Purdy series consists of deep, poorly drained or very poorly drained soils that formed in slackwater-deposited alluvial material washed mainly from acid soils on uplands. The Purdy soils are on low terraces mainly along the Tygart Valley River and Leading Creek. Slopes range from 0 to 3 percent but are dominantly less than 1 percent.

Purdy soils are on the landscape with moderately well drained Zoar soils, somewhat poorly drained Tygart and Tygart Variant soils, poorly drained Atkins soils, and the poorly drained or very poorly drained Blago soils. Purdy soils contain more clay than the Tygart Variant or Atkins soils and do not have the dark surface layer of the Blago soils.

Typical pedon of the Purdy silt loam, in a pasture, 100 yards west of U.S. Route 250, 0.75 mile north of Dailey:

Ap—0 to 9 inches, dark grayish brown (10YR 4/2) silt loam; common medium brown or dark brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; firm; many roots; very strongly acid; gradual smooth boundary.

B1g—9 to 19 inches, gray (10YR 5/1) silty clay loam; common medium strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; common roots; extremely acid; gradual smooth boundary.

B2tg—19 to 42 inches, dark gray (N 4/0) silty clay; common medium strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate fine subangular blocky; firm, sticky, plastic; few roots; continuous clay films; extremely acid; gradual smooth boundary.

C—42 to 60 inches, gray (5Y 5/1) silty clay; massive; firm, sticky, plastic; very strongly acid.

The solum thickness ranges from 28 to 50 inches, and the depth to bedrock is greater than 60 inches. The solum is generally free of gravel, but some gravel or cobblestones are in the lower part of the solum and in the C horizon of some pedons. In unlimed areas the soils are strongly acid to extremely acid throughout.

The Ap horizon has hue of 10YR, 2.5Y, or is neutral; value of 4 or 5; and chroma of 0 through 2.

The B horizon has hue of 10YR, 2.5Y, 5Y, or is neutral; value of 4 or 5; and chroma of 0 through 2. It is silty clay loam, silty clay, clay loam, or clay. The B horizon has weak or moderate, fine or medium, subangular blocky structure or prismatic structure commonly parting to subangular blocky. It has firm, slightly sticky or sticky, and slightly plastic or plastic consistence.

The C horizon has hue of 10YR, 2.5Y, 5Y or is neutral; value of 4 or 5; and chroma of 0 through 3. It is silty clay, clay loam, or clay. It has firm, slightly sticky or sticky, and slightly plastic or plastic consistence.

Shouns series

The Shouns series consists of deep, well drained soils that formed mainly in acid and lime-influenced colluvial material that moved downslope from soils on uplands. The Shouns soils are on alluvial fans, on foot slopes, or benches, and along drainageways below the Greenbrier limestone. Slopes range from 3 to 25 percent but are dominantly 8 to 15 percent.

Shouns soils are on the landscape with well drained Belmont and Meckesville soils. Shouns soils are more acid, especially in the lower part, than Belmont soils and do not have the fragipan of the Meckesville soils.

Typical pedon of Shouns silt loam, 15 to 25 percent slopes, along the west side of Route 27, about 1.8 miles north of Glady:

Ap—0 to 8 inches, brown or dark brown (7.5YR 4/4) silt loam; moderate fine granular structure; friable; common roots; slightly acid; clear smooth boundary.

B1—8 to 15 inches, brown (7.5YR 5/4) heavy silt loam; moderate fine subangular blocky structure; firm; common roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

B21t—15 to 24 inches, reddish brown (5YR 5/4) light silty clay loam; moderate fine subangular blocky structure; firm; few roots; common discontinuous clay films on ped faces; 5 percent coarse fragments; strongly acid; gradual smooth boundary.

B22t—24 to 44 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; continuous clay films

on ped faces; common fine oxide concretions; 10 percent coarse fragments; strongly acid; gradual smooth boundary.

B3—44 to 60 inches, reddish brown (5YR 4/4) shaly clay loam; moderate medium prismatic structure; firm and very firm; 30 percent coarse fragments; strongly acid.

The solum thickness ranges from 45 to 60 inches or more. The depth to bedrock is greater than 60 inches. Coarse fragments of shale, siltstone, or sandstone make up 0 to 15 percent of the upper part of the solum and 5 to 30 percent of the lower part. In unlimed areas the soils are strongly acid or medium acid throughout.

The Ap horizon has hue of 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The B horizon has hue of 7.5YR through 2.5YR, value of 4 or 5, and chroma of 4 through 8. The hue of 7.5YR is in the upper part. The B horizon is silty clay loam, clay loam, or silt loam. It has weak or moderate, fine to coarse, subangular blocky structure and friable to firm consistence.

Tygart series

The Tygart series consists of deep, somewhat poorly drained soils that formed in slackwater-deposited alluvial material that washed mainly from acid soils on uplands. The Tygart soils are on terraces mainly along the Tygart Valley River and Leading Creek. Slopes range from 0 to 3 percent.

Tygart soils are on the landscape with moderately well drained Monongahela and Zoar soils, somewhat poorly drained Tygart Variant soils, and poorly drained or very poorly drained Blago and Purdy soils. The Tygart soils are more clayey than and do not have the fragipan of the Monongahela soils, are more clayey than the Tygart Variant soils, and do not have the dark surface layer of the Blago soils.

Typical pedon of Tygart silt loam, in a hayfield on the Huttonsville Correctional Center Farm, 0.7 mile northeast of Tygart Valley River Bridge, on U.S. Route 250:

Ap—0 to 7 inches, grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many roots; medium acid; abrupt smooth boundary.

B1—7 to 10 inches, brown (10YR 5/3) silt loam; many fine strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; firm; common roots; medium acid; clear smooth boundary.

B21t—10 to 18 inches, yellowish brown (10YR 5/4) silty clay loam; many medium gray (10YR 6/1) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; common roots; continuous clay films on ped faces; few fine black concretions; strongly acid; clear smooth boundary.

B22tg—18 to 33 inches, gray (10YR 6/1) silty clay; many medium and coarse strong brown (7.5YR 5/8) mottles; moderate medium and coarse subangular blocky structure; firm, slightly sticky, slightly plastic; few roots; continuous clay films; common fine black concretions; strongly acid; gradual smooth boundary.

B3g—33 to 46 inches, gray (10YR 6/1) silty clay loam; many medium and coarse yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few roots along faces of peds; thin black continuous films on ped faces; many black concretions; strongly acid; gradual smooth boundary.

Cg—46 to 60 inches, gray (10YR 6/1) silty clay; common medium strong brown (7.5YR 5/6) mottles; massive; very firm; very strongly acid.

The solum thickness ranges from 35 to 60 inches, and the depth to bedrock is greater than 60 inches. In most areas the solum is free of gravel. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

The B2 horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 1 through 4; it has chroma of 1 and 2 in the lower part. It is silty clay, heavy silty clay loam, heavy clay loam, or clay. The B horizon has weak or moderate, fine to coarse, subangular blocky structure or prismatic structure parting to subangular blocky. It has firm, slightly sticky or sticky, and slightly plastic or plastic consistence.

The C horizon has hue of 10YR, 2.5Y, or is neutral; value of 6 or 7; and chroma of 0 through 2. It is silty clay loam, silty clay, or clay. It has firm or very firm, slightly sticky or sticky, and slightly plastic or plastic consistence.

Tygart Variant

The Tygart Variant consists of deep, somewhat poorly drained soils that formed in alluvial material washed mainly from acid soils on uplands. The Tygart Variant soils are on terraces mainly along the Tygart Valley River and Leading Creek. Slopes range from 0 to 3 percent.

Tygart Variant soils are on the landscape with moderately well drained Monongahela, Philo Variant, and Zoar soils; somewhat poorly drained Tygart soils; and poorly drained or very poorly drained Blago and Purdy soils. The Tygart Variant soils do not have the fragipan of the Monongahela soils; are less clayey than the Zoar, Tygart, Purdy, or Blago soils; and do not have the dark surface layer of the Blago soils.

Typical pedon of Tygart Variant silt loam, in a hayfield, 0.3 mile west of the low water bridge on the Huttonsville Correctional Center Farm:

Ap—0 to 10 inches, brown or dark brown (10YR 4/3) silt loam; few fine light gray (10YR 7/2) and brown or dark brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; firm; many roots; strongly acid; abrupt smooth boundary.

B1—10 to 13 inches, pale brown (10YR 6/3) loam; few fine brown or dark brown (7.5YR 4/4) mottles; weak medium prismatic structure; firm; common roots; few black films; strongly acid; abrupt wavy boundary.
B21tg—13 to 21 inches, light brownish gray (2.5Y 6/2) loam; common fine brown or dark brown (7.5YR 4/4) and strong brown (7.5YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few roots; common discontinuous clay films on ped faces; few black films; strongly acid; clear wavy boundary.
B22tg—21 to 40 inches, grayish brown (2.5Y 5/2) light clay loam; common fine brown or dark brown (7.5YR 4/4) and strong brown (7.5YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few roots; continuous clay film on prism faces; few black (10YR 2/1) concretions; very strongly acid; gradual wavy boundary.
IIB3—40 to 60 inches, reddish brown (5YR 4/4) clay loam; pockets of silt loam; common medium pinkish gray (5YR 6/2) mottles; weak coarse and very coarse prismatic structure; very firm; few roots; continuous silt or clay films on prism faces and in pores; black (N 2/0) films; very strongly acid; gradual irregular boundary.
IIC—60 to 65 inches, mixed light brownish gray (10YR 6/2) and brown (7.5YR 5/4) stratified sand and gravel; massive; loose; very strongly acid.

The solum thickness ranges from 30 to 60 inches, and the depth to bedrock is greater than 60 inches. In most areas the solum is free of gravel, but in some it makes up as much as 15 percent of the lower part of the solum. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 through 4.

The B2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 through 4. It is loam, clay loam, or silt loam. The B horizon has weak, medium to very coarse, prismatic structure commonly parting to weak or moderate, medium or coarse, subangular blocky. It has firm or very firm consistence.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 2 through 4. It is loam, clay loam, or stratified sand and gravel. It has firm to loose consistence.

Udifluvents

Udifluvents consist of moderately deep and deep, well drained and moderately well drained soils that formed in acid alluvial material washed from soils on uplands. Some areas of Udifluvents are on flood plains at an elevation of more than 3,000 feet, and some are at an elevation of less than 3,000 feet along the major tributaries of the rivers in the survey area. Slopes range from 0 to 3 percent.

Udifluvents are on the landscape with Brinkerton Variant, Buchanan, and Ernest soils at an elevation of more than 3,000 feet, and with Kanawha Variant and Pope Variant soils at an elevation of less than 3,000 feet. Udifluvents do not have the fragipan of the Brinkerton Variant, Buchanan, and Ernest soils, are flooded more frequently than Kanawha Variant soils, and are more cobbly than Pope Variant soils.

Because of the variability of Udifluvents, a typical pedon is not given. The depth to bedrock ranges from 48 inches to more than 60 inches. Coarse fragments make up 0 to 40 percent of the surface layer and 0 to 90 percent of the underlying horizons. In unlimed areas the soils are very strongly acid to neutral throughout.

The A horizon has hue of 10YR through 5YR, value of 3 or 4, and chroma of 3 through 8. It is silt loam, loam, fine sandy loam, or their cobbly counterparts.

The underlying horizons have hue of 10YR through 5YR, value of 4 through 6, and chroma of 3 through 8. They are silt loam, loam, fine sandy loam, sandy loam, loamy sand, sand, sandy clay loam, clay loam, or their cobbly or very cobbly counterparts. They have weak, medium and coarse, subangular blocky structure, or they are massive or single grain. Consistence is friable to loose.

Udorthents

Udorthents in Randolph County consist of a mixture of soil and rock materials that have been drastically disturbed by man. The areas near highways and construction sites have been cut and filled, and other areas have been surface mined for coal. The cut and fill areas are dominantly along U.S. Route 33. The surface mined areas are throughout the survey area.

Udorthents, cut and fill, are highly variable, and thus a typical pedon is not given. Coarse fragments vary in size, kind, and amount. In most places the soil material has been transported several hundred yards from the cut area to the fill site.

The surface mined areas mapped as Udorthents have at least three of the following properties (*3*):

1. Coarse fragments constitute at least 10 percent of the volume of the control section, and they are disordered such that more than 50 percent will have their long axis at an angle of at least 10 percent relative to any plane in the profile. The test for disorder should exclude fragments with a longest diameter less than 3/4 inch or more than 10 inches and should be based on numbers of coarse fragments rather than volume.
2. Mottles occur without regard to depth or spacing in the profile. The mottling involves differences of at least two color chips in the standard Munsell soil color charts. This mottling occurs among fines as well as within coarse fragments or between fines and coarse fragments.
3. If coarse fragments are fissile, the edges are frayed or splintery rather than smooth.

4. Coarse fragments bridge across voids as a result of placement of materials, leaving discontinuous, irregular pores larger than texture porosity. Such voids are present consistently but vary in frequency, prominence, and size.
5. The profile has a thin surface horizon or a horizon immediately below a surface pavement of coarse fragments that contains a higher percentage of fines than any other horizon in the profile to the bottom of the control section. This horizon ranges from 1 to 4 inches thick in most minesoils, but it may be thicker in minesoils that have been "topsoiled."
6. The profile has local pockets of material, excluding single coarse fragments, that range from 3 to 40 inches in horizontal diameter. These pockets have no lateral continuity and are the result of the original placement of materials and not postdepositional processes. They may differ from surrounding material in color (two or more Munsell color chips), soil textural or particle size class, or dominant rock type constituting the coarse fragments.
7. Artifacts are present (paper, wire, logs, cans, glass, etc.).
8. Carbolithic coarse fragments occur in noncarbolithic minesoil.
9. Oxidizable carbon is irregularly distributed with depth and not associated with stratification (laboratory determination).

Mudstone coarse fragments make up more than 65 percent of the total coarse fragment content in the control section of Udorthents, mudstone, high base (pH 5.5 to 8.0), and Udorthents, mudstone, low base (pH 4.0 to 5.5).

Typical pedon of Udorthents, mudstone, low base, about 0.5 mile southwest of Coalton, 0.2 mile west of Route 53, in a reclaimed strip mined area:

Layer 1—0 to 4 inches, dark gray (10YR 4/1) very channery silt loam; common medium grayish brown (10YR 5/2) and yellowish brown lithochromic mottles; very friable; weak fine granular structure; 50 percent coarse fragments (90 percent mudstone, 10 percent sandstone); common roots; silt coatings on coarse fragments; strongly acid; clear wavy boundary.

Layer 2—4 to 19 inches, dark grayish brown (10YR 4/2) very channery silt loam; many fine and medium yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), and yellowish red (5YR 5/6) lithochromic mottles; massive; firm; 75 percent coarse fragments (80 percent mudstone, 5 percent coal material, 15 percent sandstone); common roots; very strongly acid; gradual wavy boundary.

Layer 3—19 to 41 inches, dark grayish brown (10YR 4/2) very channery light silty clay loam; many fine and medium yellowish brown (10YR 5/4) and red (2.5YR 6/8) lithochromic mottles and many fine yellowish red (5YR 5/8) lithochromic mottles; massive; firm, friable pockets; 65 percent coarse fragments; (75 percent mudstone, 10 percent coal material, 15 percent sandstone); some voids variable in size near coarse fragments; common roots; very strongly acid.

Udorthents, mudstone, high base (pH 5.5 to 8.0), contain approximately the same percentage of coarse fragments as Udorthents, mudstone, low base (pH 4.0 to 5.5), but the high base units contain more clay in most areas.

Udorthents, mudstone and shale, high base (pH greater than 5.5); Udorthents, mudstone and shale, low base (pH 4.0 to 5.5); and Udorthents, mudstone and shale, very low base (pH less than 4.0) contain a mixture of rock types, with no single type making up more than 65 percent of the total coarse fragment content in the control section.

Typical pedon of Udorthents, mudstone and shale, low base, about 0.5 mile southeast of Cassity, on the northern end of a strip mine on Whitman Flats:

Layer 1—0 to 6 inches, brown or dark brown (10YR 4/3) channery silt loam; common medium light brown (7.5YR 6/4) and light reddish brown (2.5Y 6/4) lithochromic mottles and common fine dark gray (10YR 4/1) lithochromic mottles; weak fine granular and subangular blocky structure; very friable; many roots; 40 percent coarse fragments (40 percent mudstone, 40 percent shale, 20 percent sandstone); extremely acid; many pores in surface; clear wavy boundary.

Layer 2—6 to 23 inches, very dark grayish brown (10YR 3/2) channery silt loam; many medium yellowish brown (10YR 5/6) lithochromic mottles and many fine red (2.5YR 5/6) lithochromic mottles; massive; firm; many roots; 45 percent coarse fragments (40 percent mudstone, 35 percent shale, 20 percent sandstone, 5 percent coal); very strongly acid; clear wavy boundary.

Layer 3—23 to 40 inches, very dark grayish brown (10YR 3/2) very channery silt loam; many medium yellowish brown (10YR 5/6) and dark grayish brown (10YR 4/2) mottles and common medium red (2.5YR 4/6) mottles; massive; firm, pockets of friable material; few roots; 55 percent coarse fragments (40 percent mudstone, 35 percent shale, 20 percent sandstone, 5 percent coal); very strongly acid.

Weikert series

The Weikert series consists of shallow, well drained soils that formed in acid material weathered mainly from shale and siltstone. The Weikert soils are on the uplands adjacent to the flood plains and terraces of the Tygart Valley River and in the Leading Creek area. Slopes range from 3 to 35 percent but are dominantly 25 to 35 percent.

Weikert soils are on the landscape with well drained Berks soils and moderately well drained Ernest soils.

Weikert soils are less deep than these soils and do not have the fragipan of the Ernest soils.

Typical pedon of Weikert shaly silt loam, 15 to 25 percent slopes, in a pasture 200 feet west of Leading Creek Road, about 1 mile west of Kerns:

Ap—0 to 6 inches, dark brown (10YR 3/3) shaly silt loam; moderate fine granular structure; friable; many roots; 25 percent shale fragments; strongly acid; abrupt smooth boundary.
B2—6 to 12 inches, brown (10YR 5/3) very shaly heavy silt loam; weak fine subangular blocky structure; friable; common roots; 65 percent shale fragments; strongly acid; clear irregular boundary.
C—12 to 16 inches, brown (10YR 5/3) very shaly silt loam; friable; 85 percent shale fragments; strongly acid; gradual irregular boundary.
R—16 inches, shale.

The solum thickness ranges from 8 to 20 inches, and depth to bedrock from 10 to 20 inches. Coarse fragments of shale, siltstone, and sandstone make up 20 to 50 percent of the Ap horizon, 30 to 65 percent of the B horizon, and 60 to 85 percent of the C horizon. In unlimed areas the soils are medium acid to very strongly acid throughout.

The Ap horizon has hue of 10YR, value of 3 through 5, and chroma of 2 or 3.

The B horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It is shaly, very shaly, channery, or very channery counterparts of loam or silt loam. The B horizon has weak, fine or medium, subangular blocky structure and friable consistence.

The C horizon has hue of 10YR, value of 5, and chroma of 3 or 4. It is very shaly or very channery counterparts of silt loam or loam. It has friable consistence.

Zoar series

The Zoar series consists of deep, moderately well drained soils formed in slackwater-deposited alluvial material washed mainly from acid soils on uplands. The Zoar soils are on terraces mainly along the Tygart Valley River and Leading Creek. Slopes range from 3 to 8 percent.

Zoar soils are on the landscape with moderately well drained Monongahela soils, somewhat poorly drained Tygart and Tygart Variant soils, and poorly drained or very poorly drained Purdy soils. Zoar soils are more clayey than and do not have the fragipan of the Monongahela soils and are more clayey than the Tygart Variant soils.

Typical pedon of Zoar silt loam, 3 to 8 percent slopes, in hayfield, 1 mile northeast of the village of Elkwater, along Route 56:

Ap—0 to 8 inches, dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many roots; neutral; abrupt smooth boundary.
B1—8 to 11 inches, yellowish brown (10YR 5/4) silt loam; weak very fine subangular blocky structure; friable; many roots; strongly acid; clear smooth boundary.
B21t—11 to 19 inches, yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm, slightly plastic, slightly sticky; common roots; common discontinuous clay films on ped faces; strongly acid; gradual smooth boundary.
B22t—19 to 23 inches, yellowish brown (10YR 5/6) silty clay; common medium olive yellow (5Y 6/6) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, plastic, slightly sticky; common roots; many discontinuous clay films on ped faces; strongly acid; gradual wavy boundary.
B23t—23 to 38 inches, strong brown (7.5YR 5/8) silty clay; many medium light olive gray (5Y 6/2) and light yellowish brown (2.5Y 6/4) mottles; moderate coarse subangular blocky structure arranged in coarse prisms; firm, plastic, slightly sticky; few roots; continuous clay films on prism faces, discontinuous on secondary ped faces; strongly acid; gradual wavy boundary.
Cg—38 to 60 inches, gray (10YR 6/1) heavy clay loam; common medium strong brown (7.5YR 5/8) mottles; massive; firm; very strongly acid.

The solum thickness ranges from 30 to 48 inches, and the depth to bedrock is greater than 48 inches. Few or no coarse fragments are in the soil to a depth of 40 inches. In unlimed areas the soils are strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 3 or 4.

The B horizon has hue of 10YR through 5YR, value of 4 through 6, and chroma of 6 or 8. It is silty clay loam, silty clay, or clay. The B horizon has weak or moderate, very fine to coarse, subangular blocky or prismatic structure and firm consistence.

The C horizon has hue of 10YR, 7.5YR or 5YR; value of 5 or 6; and chroma of 1 through 4. It is silty clay, silty clay loam, or clay loam and has firm consistence.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*5*). 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 17, 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 Ultisol.

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 Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

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 Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that have a udic 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 Hapludults.

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, mesic Typic Hapludults.

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.

Formation and morphology of soils

The origin and development of the soils in the survey area are given in this section. The five factors of soil formation are listed, and their influence on the soils is described. Also described are the morphology of soils, as related to horizon nomenclature, the processes involved in horizon development, and the geologic characteristics of the area.

Factors of soil formation

The soils of the survey area have resulted from the interaction of five major factors of soil formation: parent material, time, climate, living organisms, and topography. Each factor modifies the effectiveness of the others. Parent material, topography, and time have produced the major differences among the soils in the survey area. Climate and living organisms generally show their influence throughout broad areas, and their effects are relatively uniform throughout the area.

Parent material, time, and climate

The character of the parent material strongly influences the time required for soil formation and the nature of the soil produced. The soils of the area formed in residual, colluvial, and alluvial materials. Most formed in residual material weathered from interbedded shale, siltstone, sandstone, and some limestone. For example, Berks soils formed in interbedded shale, siltstone, and fine-grain sandstone; Dekalb soils formed in sandstone; and Belmont soils formed in limestone.

In terms of years, the residual material is the oldest parent material in the survey area, but the soil forming factors in this material have been retarded by clayey material, by resistant rock, and by slope. Consequently, some of the soils that formed under these conditions are less well developed than some of the soils formed in younger material.

Colluvial material is along foot slopes and around the heads of drainageways. This material moved downslope from the acid and lime-influenced residual soils. The Shouns soils formed in colluvium below the Belmont soils; Buchanan soils formed in colluvium below the Dekalb soils; and Ernest soils formed in colluvium below the Gilpin soils.

The parent material on terraces and flood plains was washed from acid and lime-influenced soils on uplands. The soil forming processes have had considerable time to act on the terrace material. Many additions, losses, and alterations have taken place. The resulting soils, such as Tygart and Monongahela soils, are strongly leached and moderately well developed. The alluvial deposits on the flood plains are the youngest parent material in the survey area. Most of the material is physically well suited to soil formation, but the soil forming processes have had little time to act. Most soils on flood plains are weakly developed. Pope, Philo, and Atkins are examples of soils on flood plains.

Climate is generally relatively uniform throughout the survey area. Therefore, it is not responsible for most major differences in the soil; it does, however, have a

general influence on the development of horizons in the soil profile. A detailed description of climate is given in the section "General nature of the area."

Living organisms

All living organisms, including vegetation, animals, bacteria, and fungi, affect soil formation. The kind and amount of vegetation is generally responsible for the amount of organic matter, the color of the surface layer, and, in part, amount of nutrients. Earthworms and burrowing animals help keep the soil open and porous, and they mix organic matter and mineral matter by moving the soil to the surface. Bacteria and fungi decompose organic matter, thus releasing nutrients for plant food. Man influences the characteristics of the surface layer by clearing the forest and plowing.

Topography

Topography affects soil formation by its effect on the amount of water moving through the soil, the amount and rate of runoff, and the rate of erosion.

Gently sloping and strongly sloping soils have had large amounts of water move through them. This condition favors the formation of deep, moderately developed to well developed soils. On the steep and very steep hillsides, less water moves through the soil and the amount and rate of runoff are greater. In addition, the soil material is washed away almost as rapidly as it forms. Thus, it is likely that the soils on the steeper hillsides will be less deep to bedrock than the soils on the more gentle slopes.

In this survey area, topography is favorable for formation of soils on flood plains and young terraces, and formation is progressing at a rather rapid rate. Soils on flood plains are weakly developed, however, mainly because too little time has elapsed since the material was deposited.

Morphology of soils

The results of the soil forming processes can be observed in the different layers, or soil horizons, in the soil profile. The profile extends from the soil surface downward to materials that are little changed by the soil forming processes. Most soils contain three major horizons, called the A, B, and C horizons. These horizons can be further subdivided by the use of numbers and letters to indicate changes within the major horizon.

The A horizon is the surface layer. It is the layer that has the maximum accumulation of organic matter. It is also the layer of maximum leaching, or eluviation, of clay and iron.

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. The B horizon commonly has blocky structure and is generally more firm and lighter in color than the A horizon.

The C horizon is below the A and B horizons. It consists of material that is modified by weathering but is altered little by the soil forming processes.

In the survey area, many processes are involved in the formation of soil horizons. The more important of these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer or iron, the formation and translocation of clay minerals, and the formation of structure. Such processes are continually taking place and have been for thousands of years.

Most of the well drained and moderately well drained soils on uplands in the survey area have a yellowish brown or strong brown B horizon. These colors are caused mainly by iron oxides. The B horizon of these soils has blocky structure, and most have translocated clay minerals.

A fragipan has formed in the B horizon of most of the moderately well drained soils on uplands, foot slopes, and terraces. This layer is dense and brittle, is mottled, and has slow or very slow permeability to water and air. Most fragipans are grayish and are moderately well drained to poorly drained. The gray color is the result of intense reduction of iron during soil formation, a process called gleying.

Geology

Gordon Bayles, State geologist, Soil Conservation Service, assisted with the preparation of this section.

The landforms of Randolph County show the effects of uplift, folding, and geologic erosion. The relative erosion resistance of various rocks coupled with the folding have affected the topography of the county. There is a general northeast-southwest trend of the valleys and ridges. Outcrop belts follow this trend, and the more erosion-resistant formations generally are at higher elevations and in softer formations in the valleys.

Proceeding west to east, the county can be divided into four areas with somewhat different geologic features:

West of Rich Mountain.—An eroded plateau where the youngest rocks of the Pennsylvanian Age occur. The surface rocks of this area are of the Conemaugh Group, the Allegheny Formation, and the Pottsville Group. They are very gently folded and consist of sandstone, shale, and minable coal. North of Cassity, in the Conemaugh Group and the Allegheny Formation, the Gilpin, Dekalb, and Lily soils are dominant. In the Pottsville Group, south of Cassity, the Gilpin, Dekalb, and Buchanan soils are dominant. This area contains the headwaters of the Buckhannon, Middle Fork, and Elk Rivers.

Rich Mountain to Cheat Mountain.—This valley, occupied by the Tygart Valley River and Leading Creek, is a breached anticline, or an upward fold, the center of

which has been removed by erosion. The mountains are capped by Pennsylvanian Age sandstone, but the mountainsides are primarily Mississippian and Devonian Age sandstone, shale, limestone, and siltstone. Alluvial deposits on the valley floor are underlain by shale. Ernest, Atkins, Monongahela, and Philo soils are dominant on the valley floor. Calvin high base substratum, Belmont, and Meckesville soils are on the Mississippian Age material in a narrow band along the valley rim. Berks, Calvin, and Weikert soils are on the Devonian Age material on most of the valley side slopes.

Cheat Mountain to Shavers Mountain.—This area is essentially a valley on top of a mountain. The area occupies a down fold, or syncline, and is the valley of Shavers Fork. Surface rocks are Pennsylvanian Age sandstone of the Pottsville Group, with some shale and several minable coal seams. Dekalb and Buchanan soils are dominant.

Shavers Mountain to Allegheny Mountain.—An area of broad gentle folds occupied by the headwaters of Glady, Laurel, Dry Fork, and Gandy Creeks. Most of the rocks are sandstone, siltstone, and shale of the Upper Devonian Age material; the exceptions are the Dry Fork area, where younger Mississippian Age rocks outcrop, and the Flatrock and Roaring Plains area, where even younger Pennsylvanian rocks are found. Dekalb, Berks, and Calvin soils are dominant on the Devonian Age material. Calvin high base substratum, Belmont, and Meckesville soils are on the Mississippian Age material in the Dry Fork area. Dekalb and Brinkerton Variant soils are on broad mountaintops in the Flatrock and Roaring Plains part of the county.

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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.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

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.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Carbolith. Dark-colored sedimentary rocks that will make a black or very dark (Munsell value of 3 or less) streak or powder. Carbolith material includes coal not scheduled for mining, impure waste coal, bone coal, high-carbon shales, and high-carbon muds. In general, this material contains at least 25 percent carbonaceous matter oxidizable at 350 to 400° C.

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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. Mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, (6 to 15 inches) 15 to 37.5 centimeters long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

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. Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods

during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Fissile. Having a tendency to split along parallel planes into layers that are less than 5 mm thick.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. None means that flooding is not probable; rare that it is unlikely but possible under unusual weather conditions; occasional that it occurs on an average of one or more 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. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

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.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green manure (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 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.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minesoil. A soil in recently deposited material from deep mining, surface mining, or other earth-moving operations.

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. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudrock. A broad term for a sedimentary rock dominated by silt-size and/or clay-size particles. The term is used when a rock cannot be definitely distinguished as either a mudstone or shale. Mudrock can be further subdivided into hard mudrock (moist hardness greater than 2.5) or normal mudrock (moist hardness less than 2.5). Mudrock may contain as much as 50 percent sand-size particles if properties are judged to be dominated by silt and/or clay. Mudrocks may contain any proportion of carbonates so long as properties are dominantly silt and/or clay when the material is rubbed in water.

Mudstone. A nonfissile mudrock dominated by silt-size and/or clay-size particles. Mudstones have a moist hardness of less than 2.5 (can be scratched with fingernail). They differ from shale because of their nonfissile nature. Mudstones may contain as much as 50 percent sand-size particles if properties are judged to be dominated by silt and/or clay.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

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.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under specific management.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited chemically or from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; mudstone and shale, formed from silt and/or clay; and limestone, formed from chemical precipitation of calcium carbonate or carbonate fossils. 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.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shale (minesoil). A mudrock that appears predominantly fissile (having a tendency to split along parallel planes into thin layers). These layers must be less than 5 mm thick. Shales can be further subdivided into hard shale (moist hardness greater than 2.5) and normal shales (moist hardness less than 2.5). They differ from mudstones because of their fissile nature.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil 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.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

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, silt loam, 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.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the low lands 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.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.
Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.
Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.
Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	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	40.0	18.1	29.1	68	-15	35	3.29	2.12	4.34	10	12.5
February	42.4	20.1	31.2	68	-11	37	3.06	1.98	4.03	9	13.9
March	50.9	27.7	39.3	80	6	105	3.82	2.37	5.13	11	9.5
April	62.1	36.2	49.2	84	17	283	3.89	2.38	5.24	11	3.0
May	71.3	44.9	58.1	86	25	561	3.76	2.24	5.11	9	.1
June	78.1	52.6	65.4	90	35	762	4.28	2.89	5.55	9	.0
July	80.9	57.0	69.0	90	40	899	4.45	3.03	5.74	9	.0
August	79.5	55.8	67.7	90	40	859	3.99	2.67	5.19	8	.0
September	74.5	49.2	61.9	89	30	657	3.07	1.88	4.14	7	.0
October	64.6	37.1	50.9	81	17	346	2.75	1.22	3.99	6	.5
November	51.6	29.0	40.3	75	5	79	2.61	1.73	3.41	8	5.7
December	42.5	21.8	32.2	71	-8	69	3.35	2.01	4.54	10	13.3
Year	61.5	37.5	49.5	93	-15	4,692	42.32	37.83	47.07	107	58.5

[1]Recorded in the period 1951-74 at Elkins, West Virginia.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 4	May 14	June 1
2 years in 10 later than--	April 29	May 9	May 26
5 years in 10 later than--	April 19	April 29	May 14
First freezing temperature in fall:			
1 year in 10 earlier than--	October 9	September 28	September 18
2 years in 10 earlier than--	October 14	October 2	September 22
5 years in 10 earlier than--	October 24	October 10	September 30

[1]Recorded in the period 1951-74 at Elkins, West Virginia.

TABLE 3.--GROWING SEASON

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	164	144	118
8 years in 10	172	150	125
5 years in 10	187	163	138
2 years in 10	201	175	151
1 year in 10	209	181	158

[1]Recorded in the period 1951-74 at Elkins, West Virginia.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
At	Atkins silt loam	4,260	0.7
BaB	Belmont silt loam, 3 to 8 percent slopes	210	*
BaC	Belmont silt loam, 8 to 15 percent slopes	1,730	0.3
BaD	Belmont silt loam, 15 to 25 percent slopes	740	0.1
BaE	Belmont silt loam, 25 to 35 percent slopes	500	0.1
BbC	Belmont stony silt loam-Rock outcrop complex, 3 to 15 percent slopes	1,540	0.3
BbD	Belmont stony silt loam-Rock outcrop complex, 15 to 25 percent slopes	3,530	0.6
BbE	Belmont stony silt loam-Rock outcrop complex, 25 to 35 percent slopes	9,800	1.6
BbF	Belmont stony silt loam-Rock outcrop complex, 35 to 70 percent slopes	7,150	1.2
BeC	Berks channery silt loam, 3 to 15 percent slopes	1,590	0.3
BeD	Berks channery silt loam, 15 to 25 percent slopes	1,800	0.3
BeE	Berks channery silt loam, 25 to 35 percent slopes	3,140	0.5
BeF	Berks channery silt loam, 35 to 70 percent slopes	57,160	9.5
BgC	Berks channery silt loam, moist, 3 to 15 percent slopes	2,000	0.3
BgD	Berks channery silt loam, moist, 15 to 25 percent slopes	2,050	0.4
BgE	Berks channery silt loam, moist, 25 to 35 percent slopes	4,150	0.7
BgF	Berks channery silt loam, moist, 35 to 70 percent slopes	6,850	1.2
BkC	Berks-Weikert complex, 8 to 15 percent slopes	1,930	0.3
BkD	Berks-Weikert complex, 15 to 25 percent slopes	4,280	0.7
BkE	Berks-Weikert complex, 25 to 35 percent slopes	12,080	2.0
BkF	Berks-Weikert complex, 35 to 70 percent slopes	14,890	2.5
Bo	Blago silty clay loam	480	0.1
BrB	Brinkerton Variant silt loam, 3 to 8 percent slopes	2,710	0.5
BsC	Brinkerton Variant very stony silt loam, 3 to 15 percent slopes	2,840	0.5
BtC	Buchanan and Ernest stony soils, 3 to 15 percent slopes	21,240	3.5
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	46,850	7.8
CaC	Calvin channery silt loam, 3 to 15 percent slopes	1,890	0.3
CaD	Calvin channery silt loam, 15 to 25 percent slopes	4,330	0.7
CaE	Calvin channery silt loam, 25 to 35 percent slopes	7,250	1.2
CaF	Calvin channery silt loam, 35 to 70 percent slopes	23,200	3.9
CbB	Calvin silt loam, high base substratum, 3 to 8 percent slopes	600	0.1
CbC	Calvin silt loam, high base substratum, 8 to 15 percent slopes	4,480	0.7
CbD	Calvin silt loam, high base substratum, 15 to 25 percent slopes	1,800	0.3
CbE	Calvin silt loam, high base substratum, 25 to 35 percent slopes	940	0.2
CbF	Calvin silt loam, high base substratum, 35 to 70 percent slopes	830	0.1
CcC	Calvin stony silt loam, high base substratum, 3 to 15 percent slopes	2,190	0.4
CcD	Calvin stony silt loam, high base substratum, 15 to 25 percent slopes	6,220	1.0
CcE	Calvin stony silt loam, high base substratum, 25 to 35 percent slopes	11,330	1.9
CcF	Calvin stony silt loam, high base substratum, 35 to 70 percent slopes	30,220	5.0
Ch	Chavies fine sandy loam	530	0.1
CoB	Cookport Variant silt loam, 3 to 8 percent slopes	1,790	0.3
CsC	Cookport Variant very stony silt loam, 3 to 15 percent slopes	2,690	0.4
DaB	Dekalb channery loam, 3 to 8 percent slopes	260	*
DaC	Dekalb channery loam, 8 to 15 percent slopes	4,080	0.7
DaD	Dekalb channery loam, 15 to 25 percent slopes	2,130	0.4
DaE	Dekalb channery loam, 25 to 35 percent slopes	1,350	0.2
DaF	Dekalb channery loam, 35 to 70 percent slopes	860	0.1
DbB	Dekalb channery loam, moist, 3 to 8 percent slopes	2,150	0.4
DbC	Dekalb channery loam, moist, 8 to 15 percent slopes	11,000	1.8
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	5,000	0.8
DbE	Dekalb channery loam, moist, 25 to 35 percent slopes	8,150	1.4
DbF	Dekalb channery loam, moist, 35 to 70 percent slopes	5,250	0.9
DmC	Dekalb extremely stony loam, 3 to 15 percent slopes	1,280	0.2
DmE	Dekalb extremely stony loam, 15 to 35 percent slopes	2,820	0.5
DmF	Dekalb extremely stony loam, 35 to 70 percent slopes	6,490	1.1
DrC	Dekalb extremely stony loam, moist, 3 to 15 percent slopes	14,400	2.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	17,100	2.9
DrF	Dekalb extremely stony loam, moist, 35 to 70 percent slopes	17,950	3.0
DsD	Dekalb rubbly loam, 3 to 25 percent slopes	4,270	0.7
DsF	Dekalb rubbly loam, 25 to 80 percent slopes	5,010	0.7
EnB	Ernest silt loam, 3 to 8 percent slopes	1,110	0.2
EnC	Ernest silt loam, 8 to 15 percent slopes	8,740	1.5
EnD	Ernest silt loam, 15 to 25 percent slopes	3,270	0.5
EsC	Ernest rubbly silt loam, 3 to 15 percent slopes	1,880	0.3
EsE	Ernest rubbly silt loam, 15 to 35 percent slopes	3,010	0.5
Fu	Fluvaquents-Udifluvents complex	1,930	0.3
GcC	Gilpin channery silt loam, 3 to 15 percent slopes	5,500	0.9
GcD	Gilpin channery silt loam, 15 to 25 percent slopes	2,940	0.5
GcE	Gilpin channery silt loam, 25 to 35 percent slopes	3,060	0.5
GcF	Gilpin channery silt loam, 35 to 70 percent slopes	440	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
GdC	Gilpin-Dekalb stony complex, 3 to 15 percent slopes	1,350	0.2
GdE	Gilpin-Dekalb stony complex, 15 to 35 percent slopes	16,750	2.9
GdF	Gilpin-Dekalb stony complex, 35 to 70 percent slopes	3,760	0.6
GkC	Gilpin-Dekalb stony complex, moist, 3 to 15 percent slopes	4,400	0.7
GkE	Gilpin-Dekalb stony complex, moist, 15 to 35 percent slopes	26,200	4.4
GkF	Gilpin-Dekalb stony complex, moist, 35 to 70 percent slopes	24,150	4.1
Ka	Kanawha loam	1,170	0.2
Kv	Kanawha Variant gravelly loam	1,170	0.2
LeD	Leetonia rubbly loamy sand, 3 to 25 percent slopes	3,780	0.6
LyB	Lily loam, 3 to 8 percent slopes	2,240	0.4
LyC	Lily loam, 8 to 15 percent slopes	4,560	0.8
MkC	Meckesville stony silt loam, 3 to 15 percent slopes	3,670	0.6
MkE	Meckesville stony silt loam, 15 to 35 percent slopes	9,730	1.6
Mm	Medihemists, moderately deep	70	*
MoA	Monongahela silt loam, 0 to 3 percent slopes	130	*
MoB	Monongahela silt loam, 3 to 8 percent slopes	2,750	0.5
MoC	Monongahela silt loam, 8 to 15 percent slopes	300	0.1
Ph	Philo loam	3,260	0.5
Pm	Philo Variant silt loam	1,290	0.2
Pn	Pope-Atkins complex	5,140	0.9
Po	Pope and Linden fine sandy loams	2,250	0.4
Pv	Pope Variant gravelly sandy loam	1,870	0.3
Py	Purdy silt loam	900	0.2
Rn	Rubble land	700	0.1
ShC	Shouns silt loam, 3 to 15 percent slopes	2,750	0.5
ShD	Shouns silt loam, 15 to 25 percent slopes	550	0.1
Tg	Tygart silt loam	1,760	0.3
Tv	Tygart Variant silt loam	1,320	0.2
Ud	Udifluvents, cobbly	4,430	0.7
U1	Udorthents, cut and fill	380	0.1
U2	Udorthents, mudstone, high base	610	0.1
U3	Udorthents, mudstone, low base	830	0.1
U4	Udorthents, mudstone and shale, high base	410	0.1
U5	Udorthents, mudstone and shale, low base	3,260	0.5
U6	Udorthents, mudstone and shale, very low base	120	*
WeC	Weikert shaly silt loam, 3 to 15 percent slopes	230	*
WeD	Weikert shaly silt loam, 15 to 25 percent slopes	140	*
WeE	Weikert shaly silt loam, 25 to 35 percent slopes	490	0.1
ZoB	Zoar silt loam, 3 to 8 percent slopes	820	0.1
	Water	2,559	0.4
	Total	599,469	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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
	Bu	Bu	Bu	Ton	Ton	AUM*
At---------- Atkins	100	60	30	3.0	---	4.0
BaB---------- Belmont	---	75	45	3.5	4.5	5.5
BaC---------- Belmont	---	70	40	3.0	4.0	4.5
BaD---------- Belmont	---	60	35	3.0	4.0	4.5
BaE---------- Belmont	---	---	---	---	---	4.0
BbC---------- Belmont-Rock outcrop	---	---	---	---	---	4.0
BbD---------- Belmont-Rock outcrop	---	---	---	---	---	4.0
BbE---------- Belmont-Rock outcrop	---	---	---	---	---	---
BbF---------- Belmont-Rock outcrop	---	---	---	---	---	---
BeC---------- Berks	75	55	35	2.5	3.0	4.0
BeD---------- Berks	70	50	30	2.5	3.0	3.0
BeE---------- Berks	---	---	---	---	---	2.5
BeF---------- Berks	---	---	---	---	---	---
BgC---------- Berks	---	55	35	2.5	3.0	4.0
BgD---------- Berks	---	50	30	2.5	3.0	3.0
BgE---------- Berks	---	---	---	---	---	2.5
BgF---------- Berks	---	---	---	---	---	---
BkC---------- Berks-Weikert	65	50	30	2.0	2.5	3.5
BkD---------- Berks-Weikert	---	---	---	---	---	3.0
BkE---------- Berks-Weikert	---	---	---	---	---	---
BkF---------- Berks-Weikert	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
	Bu	Bu	Bu	Ton	Ton	AUM*
Bo---------- Blago	90	55	---	4.0	---	4.0
BrB---------- Brinkerton Variant	95	60	---	3.0	---	4.0
BsC---------- Brinkerton Variant	---	---	---	---	---	---
BtC---------- Buchanan and Ernest	---	---	---	---	---	3.5
BtE---------- Buchanan and Ernest	---	---	---	---	---	3.0
CaC---------- Calvin	75	55	35	2.5	3.0	4.0
CaD---------- Calvin	70	50	30	2.0	3.0	3.0
CaE---------- Calvin	---	---	---	---	---	2.5
CaF---------- Calvin	---	---	---	---	---	---
CbB---------- Calvin	---	70	40	3.5	4.0	4.5
CbC---------- Calvin	---	65	35	3.0	4.0	4.5
CbD---------- Calvin	---	60	30	2.5	3.5	4.0
CbE---------- Calvin	---	---	---	---	---	3.5
CbF---------- Calvin	---	---	---	---	---	---
CcC, CcD---------- Calvin	---	---	---	---	---	3.0
CcE, CcF---------- Calvin	---	---	---	---	---	---
Ch---------- Chavies	120	75	45	3.0	4.5	5.0
CoB---------- Cookport Variant	---	65	40	3.0	3.5	4.5
CsC---------- Cookport Variant	---	---	---	---	---	---
DaB---------- Dekalb	80	60	35	3.0	3.5	4.0
DaC---------- Dekalb	75	55	35	2.5	3.0	4.0
DaD---------- Dekalb	70	50	30	2.0	3.0	3.0
DaE---------- Dekalb	---	---	---	---	---	2.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
	Bu	Bu	Bu	Ton	Ton	AUM*
DaF---------- Dekalb	---	---	---	---	---	---
DbB---------- Dekalb	---	60	35	3.0	3.5	4.0
DbC---------- Dekalb	---	55	35	2.5	3.0	4.0
DbD---------- Dekalb	---	50	30	2.0	3.0	3.0
DbE---------- Dekalb	---	---	---	---	---	2.5
DbF, DmC, DmE, DmF, DrC, DrE, DrF, DsD---------- Dekalb	---	---	---	---	---	---
DsF---------- Dekalb	---	---	---	---	---	---
EnB---------- Ernest	100	65	40	3.0	3.5	4.5
EnC---------- Ernest	95	60	35	3.0	3.5	4.0
EnD---------- Ernest	90	55	35	2.5	3.0	3.5
EsC, EsE---------- Ernest	---	---	---	---	---	---
Fu---------- Fluvaquents-Udifluvents	---	---	---	---	---	---
GcC---------- Gilpin	85	60	35	3.0	3.5	4.5
GcD---------- Gilpin	80	55	30	2.5	3.0	4.0
GcE---------- Gilpin	---	---	---	---	---	3.0
GcF---------- Gilpin	---	---	---	---	---	---
GdC, GkC---------- Gilpin-Dekalb	---	---	---	---	---	3.5
GdE, GdF, GkE, GkF-------- Gilpin-Dekalb	---	---	---	---	---	---
Ka---------- Kanawha	135	80	50	3.5	5.0	5.5
Kv---------- Kanawha Variant	125	75	45	3.5	4.5	5.0
LeE---------- Leetonia	---	---	---	---	---	---
LyB---------- Lily	95	65	40	3.5	4.0	4.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
	Bu	Bu	Bu	Ton	Ton	AUM*
LyC---- Lily	85	60	35	3.0	3.5	4.5
MkC, MkE---- Meckesville	---	---	---	---	---	3.5
Mm**. Medihemists						
MoA---- Monongahela	110	65	40	3.0	3.5	4.5
MoB---- Monongahela	110	65	40	3.0	3.5	4.5
MoC---- Monongahela	90	60	35	3.0	3.0	4.5
Ph---- Philo	130	80	45	3.5	4.5	5.5
Pm---- Philo Variant	130	80	50	3.5	4.5	5.5
Pn---- Pope-Atkins	105	65	35	3.0	---	5.0
Po---- Pope and Linden	130	80	45	3.5	4.5	5.5
Pv---- Pope Variant	75	55	30	3.0	3.5	3.5
Py---- Purdy	80	55	---	2.5	---	4.0
Rn**. Rubble land						
ShC---- Shouns	85	65	35	3.0	4.0	4.5
ShD---- Shouns	75	60	30	2.5	3.5	4.0
Tg---- Tygart	95	60	---	3.0	3.0	4.5
Tv---- Tygart Variant	100	60	---	3.0	3.5	4.5
Ud**. Udifluvents						
U1**, U2**, U3**, U4**, U5**, U6**. Udorthents						
WeC---- Weikert	60	45	20	2.0	2.0	3.0
WeD---- Weikert	---	---	---	---	---	2.5
WeE---- Weikert	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
	Bu	Bu	Bu	Ton	Ton	AUM*
ZoB---------- Zoar	90	65	40	3.0	3.5	4.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	1,170	---	---	---
II	20,560	11,930	6,930	1,700
III	57,830	48,620	7,340	1,870
IV	36,140	26,540	9,230	370
V	---	---	---	---
VI	71,440	32,820	---	48,120
VII	397,030	121,560	---	265,970
VIII	---	---	---	---

TABLE 7.--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. Plant competition rating is for conifers]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
At Atkins	1w	Slight	Severe	Severe	Severe	Pin oak Red maple American sycamore	85 --- ---	Eastern white pine, Norway spruce.
BaB, BaC Belmont	2o	Slight	Slight	Slight	Moderate	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	77 80 80 90 80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
BaD Belmont (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	80 80 80 90 80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
BaD Belmont (South Aspect)	3r	Moderate	Moderate	Slight	Moderate	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	70 70 70 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
BaE Belmont (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	80 80 80 90 80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
BaE Belmont (South Aspect)	3r	Moderate	Moderate	Slight	Moderate	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	70 70 70 80 70	Eastern white pine, yellow-poplar, black walnut, Norway Spruce.
BbC*: Belmont	3o	Slight	Slight	Slight	Moderate	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	70 70 70 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
Rock outcrop.								
BbD*: Belmont (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	80 80 80 90 80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
Rock outcrop.								
BbD*: Belmont (South Aspect)	3r	Moderate	Moderate	Slight	Moderate	Northern red oak Black cherry White ash Yellow-poplar Sugar maple	70 70 70 80 70	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
Rock outcrop.								

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
BbE*:								
Belmont (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak	80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
						Black cherry	80	
						White ash	80	
						Yellow-poplar	90	
						Sugar maple	80	
Rock outcrop.								
BbE*:								
Belmont (South Aspect)	3r	Moderate	Moderate	Slight	Moderate	Northern red oak	70	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
						Black cherry	70	
						White ash	70	
						Yellow-poplar	80	
						Sugar maple	70	
Rock outcrop.								
BbF*:								
Belmont (North Aspect)	2r	Severe	Severe	Slight	Severe	Northern red oak	80	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
						Black cherry	80	
						White ash	80	
						Yellow-poplar	90	
						Sugar maple	80	
Rock outcrop.								
BbF*:								
Belmont (South Aspect)	3r	Severe	Severe	Slight	Moderate	Northern red oak	70	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
						Black cherry	70	
						White ash	70	
						Yellow-poplar	80	
						Sugar maple	70	
Rock outcrop.								
BeC---- Berks	3f	Slight	Slight	Moderate	Moderate	Northern red oak	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak	70	
						Virginia pine	70	
						Eastern white pine	80	
BeD---- Berks (North Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak	70	
						Virginia pine	70	
						Eastern white pine	80	
BeD---- Berks (South Aspect)	4f	Slight	Moderate	Severe	Slight	Northern red oak	60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Scarlet oak	60	
						Virginia pine	60	
						Eastern white pine	70	
BeE---- Berks (North Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak	70	
						Virginia pine	70	
						Eastern white pine	80	
BeE---- Berks (South Aspect)	4f	Slight	Moderate	Severe	Slight	Northern red oak	60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Scarlet oak	60	
						Virginia pine	60	
						Eastern white pine	70	
BeF---- Berks (North Aspect)	3f	Moderate	Severe	Moderate	Moderate	Northern red oak	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak	70	
						Virginia pine	70	
						Eastern white pine	80	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
BeF---------- Berks (South Aspect)	4f	Moderate	Severe	Severe	Slight	Northern red oak----	60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Scarlet oak----------	60	
						Virginia pine-------	60	
						Eastern white pine--	70	
BgC---------- Berks	2f	Slight	Slight	Moderate	Moderate	Black cherry--------	80	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
BgD, BgE---------- Berks	2f	Slight	Moderate	Moderate	Moderate	Black cherry--------	80	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
BgF---------- Berks	2f	Moderate	Severe	Moderate	Moderate	Black cherry--------	80	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
BkC*: Berks----------	3f	Slight	Slight	Moderate	Moderate	Northern red oak----	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak----------	70	
						Virginia pine-------	70	
						Eastern white pine--	80	
Weikert----------	4d	Slight	Slight	Severe	Slight	Northern red oak----	59	Virginia pine, shortleaf pine, red pine, eastern white pine.
						Virginia pine-------	56	
BkD*: Berks---------- (North Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak----	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak----------	70	
						Virginia pine-------	70	
						Eastern white pine--	80	
Weikert---------- (North Aspect)	4d	Slight	Moderate	Severe	Slight	Northern red oak----	64	Eastern white pine, Virginia pine.
						Virginia pine-------	60	
BkD*: Berks---------- (South Aspect)	4f	Slight	Moderate	Severe	Slight	Northern red oak----	60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak----------	60	
						Virginia pine-------	60	
Weikert---------- (South Aspect)	5d	Slight	Moderate	Severe	Slight	Northern red oak----	55	Virginia pine.
						Virginia pine-------	52	
BkE*: Berks---------- (North Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak----	70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
						Black oak----------	70	
						Virginia pine-------	70	
Weikert---------- (North Aspect)	4d	Slight	Moderate	Severe	Slight	Northern red oak----	64	Eastern white pine, Virginia pine.
						Virginia pine-------	60	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
BkE*:								
Berks (South Aspect)	4f	Slight	Moderate	Severe	Slight	Northern red oak Scarlet oak Virginia pine	60 60 60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
Weikert (South Aspect)	5d	Slight	Moderate	Severe	Slight	Northern red oak Virginia pine Scarlet oak	55 52 50	Virginia pine, pitch pine, eastern white pine.
BkF*:								
Berks (North Aspect)	3f	Moderate	Severe	Moderate	Moderate	Northern red oak Black oak Virginia pine	70 70 70	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
Weikert	4d	Moderate	Severe	Severe	Slight	Northern red oak Virginia pine	64 60	Eastern white pine, Virginia pine.
BkF*:								
Berks (South Aspect)	4f	Moderate	Severe	Severe	Slight	Northern red oak Scarlet oak Virginia pine	60 60 60	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine.
Weikert (South Aspect)	5d	Moderate	Severe	Severe	Slight	Northern red oak Virginia pine Scarlet oak	55 52 50	Virginia pine, pitch pine, eastern white pine.
Bo Blago	1w	Slight	Severe	Severe	Severe	Pin oak Red maple	95 95	Eastern white pine, Norway spruce.
BrB Brinkerton Variant	3w	Slight	Moderate	Moderate	Severe	Northern red oak Yellow-poplar	70 75	Eastern white pine, yellow-poplar, Norway spruce.
BsC Brinkerton Variant	3w	Moderate	Moderate	Moderate	Severe	Northern red oak Yellow-poplar	70 75	Eastern white pine, yellow-poplar, Norway spruce.
BtC*:								
Buchanan	3d	Slight	Slight	Slight	Severe	Northern red oak Yellow-poplar	70 75	Northern red oak, yellow-poplar, sugar maple, eastern white pine, Japanese larch.
Ernest	2w	Moderate	Moderate	Slight	Severe	Northern red oak Yellow-poplar White ash Black walnut	80 90 --- ---	Eastern white pine, Norway spruce.
BtE*:								
Buchanan	3r	Moderate	Moderate	Slight	Severe	Northern red oak Yellow-poplar	70 90	Northern red oak, yellow-poplar, sugar maple, eastern white pine, Japanese larch.
Ernest	2w	Severe	Moderate	Slight	Severe	Northern red oak Yellow-poplar White ash Black walnut	80 90 --- ---	Eastern white pine, Norway spruce.
CaC Calvin	3f	Slight	Slight	Moderate	Moderate	Yellow-poplar Northern red oak	71 71	Eastern white pine, red pine, Virginia pine.
CaD Calvin (North Aspect)	2f	Slight	Moderate	Moderate	Moderate	Yellow-poplar Northern red oak	80 77	Eastern white pine, red pine, Virginia pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
CaD---- Calvin (South Aspect)	3f	Slight	Moderate	Severe	Moderate	Northern red oak----	67	Eastern white pine, red pine, Virginia pine, Norway spruce, European larch.
						Black oak----	65	
						White oak----	65	
CaE---- Calvin (North Aspect)	2f	Slight	Moderate	Moderate	Severe	Northern red oak----	77	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar----	80	
CaE---- Calvin (South Aspect)	3f	Slight	Moderate	Severe	Moderate	Northern red oak----	67	Eastern white pine, red pine, Virginia pine, Norway spruce, European larch.
						Black oak----	65	
						White oak----	65	
CaF---- Calvin (North Aspect)	2f	Moderate	Severe	Moderate	Severe	Northern red oak----	77	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar----	80	
CaF---- Calvin (South Aspect)	3f	Moderate	Severe	Severe	Moderate	Northern red oak----	67	Eastern white pine, red pine, Virginia pine, Norway spruce, European larch.
						Black oak----	65	
						White oak----	65	
CbB, CbC---- Calvin	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree----	80	
						Black cherry----	80	
						Yellow-poplar----	90	
						Sugar maple----	---	
						Black locust----	---	
						Black walnut----	---	
CbD---- Calvin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree----	80	
						Black cherry----	80	
						Sugar maple----	---	
						Yellow-poplar----	90	
						Black locust----	---	
						Black walnut----	---	
CbD---- Calvin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----	70	
						Black cherry----	70	
						Sugar maple----	---	
						Black locust----	---	
CbE---- Calvin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree----	80	
						Black cherry----	80	
						Sugar maple----	---	
						Yellow-poplar----	90	
						Black locust----	---	
						Black walnut----	---	
CbE---- Calvin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----	70	
						Black cherry----	70	
						Sugar maple----	---	
						Black locust----	---	
CbF---- Calvin (North Aspect)	2r	Severe	Severe	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree----	80	
						Black cherry----	80	
						Sugar maple----	---	
						Yellow-poplar----	90	
						Black locust----	---	
						Black walnut----	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
CbF---------- Calvin (South Aspect)	3r	Severe	Severe	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----------	70	
						Black cherry--------	70	
						Sugar maple---------	---	
						Black locust--------	---	
CcC---------- Calvin	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree--------	80	
						Black cherry--------	80	
						Sugar maple---------	---	
						Yellow-poplar-------	90	
						Black locust--------	---	
						Black walnut--------	---	
CcD---------- Calvin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree--------	80	
						Black cherry--------	80	
						Sugar maple---------	---	
						Yellow-poplar-------	90	
						Black locust--------	---	
						Black walnut--------	---	
CcD---------- Calvin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----------	70	
						Black cherry--------	70	
						Sugar maple---------	---	
						Black locust--------	---	
CcE---------- Calvin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree--------	80	
						Black cherry--------	80	
						Sugar maple---------	---	
						Yellow-poplar-------	90	
						Black locust--------	---	
						Black walnut--------	---	
CcE---------- Calvin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----------	70	
						Black cherry--------	70	
						Sugar maple---------	---	
						Black locust--------	---	
CcF---------- Calvin (North Aspect)	2r	Severe	Severe	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, black walnut, Japanese larch, black locust, yellow-poplar.
						Cucumbertree--------	80	
						Black cherry--------	80	
						Sugar maple---------	---	
						Yellow-poplar-------	90	
						Black locust--------	---	
						Black walnut--------	---	
CcF---------- Calvin (South Aspect)	3r	Severe	Severe	Moderate	Moderate	Northern red oak----	70	Eastern white pine, Norway spruce, Japanese larch, black locust.
						Black oak----------	70	
						Black cherry--------	70	
						Sugar maple---------	---	
						Black locust--------	---	
Ch---------- Chavies	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Eastern white pine, yellow-poplar, black walnut.
						Yellow-poplar-------	90	
						Pin oak------------	90	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
CoB, CsC---------- Cookport Variant	2w	Slight	Moderate	Slight	Severe	Northern red oak----	75	Yellow-poplar, Eastern white pine, black cherry, Norway spruce.
						Black cherry--------	90	
						Yellow-poplar-------	90	
						White ash----------	80	
						Sugar maple---------	80	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
DaB, DaC---------- Dekalb	3f	Slight	Slight	Slight	Moderate	Northern red oak----	70	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						White ash----------	80	
DaD---------- Dekalb (North Aspect)	2f	Slight	Moderate	Slight	Severe	Northern red oak----	76	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						Yellow-poplar-------	95	
DaD---------- Dekalb (South Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak----	66	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar-------	75	
DaE---------- Dekalb (North Aspect)	2f	Slight	Moderate	Slight	Severe	Northern red oak----	76	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						Yellow-poplar-------	93	
DaE---------- Dekalb (South Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak----	66	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar-------	75	
DaF---------- Dekalb (North Aspect)	2f	Moderate	Severe	Slight	Severe	Northern red oak----	76	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						Yellow-poplar-------	93	
DaF---------- Dekalb (South Aspect)	3f	Moderate	Severe	Moderate	Moderate	Northern red oak----	66	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar-------	75	
DbB, DbC---------- Dekalb	2o	Slight	Slight	Slight	Moderate	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DbD, DbE---------- Dekalb	2r	Slight	Moderate	Slight	Moderate	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DbF---------- Dekalb	2r	Moderate	Severe	Slight	Moderate	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple----------	---	
						White ash----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DmC---------- Dekalb	3x	Slight	Moderate	Slight	Moderate	Northern red oak----	70	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						White ash----------	80	
DmE---------- Dekalb (North Aspect)	2x	Slight	Severe	Slight	Severe	Northern red oak----	76	Norway spruce, yellow-poplar, black cherry, Eastern white pine, Japanese larch.
						Yellow-poplar-------	93	
DmE---------- Dekalb (South Aspect)	3x	Slight	Severe	Moderate	Moderate	Northern red oak----	66	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar-------	75	
DmF---------- Dekalb (North Aspect)	2x	Moderate	Severe	Slight	Severe	Northern red oak----	76	Norway spruce, yellow-poplar, black cherry.
						Yellow-poplar-------	93	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
DmF---- Dekalb (South Aspect)	3x	Moderate	Severe	Moderate	Moderate	Northern red oak----	66	Eastern white pine, red pine, Virginia pine.
						Yellow-poplar-------	75	
DrC---- Dekalb	2x	Slight	Moderate	Slight	Severe	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple-----------	---	
						White ash-----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DrE---- Dekalb	2x	Slight	Severe	Slight	Severe	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
						Red maple-----------	---	
						White ash-----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DrF---- Dekalb	2x	Moderate	Severe	Slight	Severe	Black cherry--------	84	Eastern white pine, red pine, Norway spruce, Japanese larch, eastern white pine.
						Red maple-----------	---	
						White ash-----------	---	
						Cucumbertree--------	---	
						Yellow birch--------	---	
DsD---- Dekalb	5x	Slight	Severe	Severe	Slight	Yellow birch--------	50	Red spruce, Norway spruce.
						Red maple-----------	50	
						Red spruce----------	35	
						Black cherry--------	50	
DsF---- Dekalb	5x	Moderate	Severe	Severe	Slight	Yellow birch--------	50	Red spruce, Norway spruce.
						Red maple-----------	50	
						Red spruce----------	35	
						Black cherry--------	50	
EnB---- Ernest	2w	Slight	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, yellow poplar, Japanese larch
						Yellow-poplar-------	90	
						White ash-----------	---	
						Black walnut--------	---	
EnC---- Ernest	2w	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce, yellow-poplar, Japanese larch.
						Yellow-poplar-------	90	
						White ash-----------	---	
						Black walnut--------	---	
EnD---- Ernest	2w	Severe	Moderate	Slight	Severe	Northern red oak----	80	Eastern white pine, Norway spruce.
						Yellow poplar-------	90	
						White ash-----------	---	
						Black walnut--------	---	
EsC---- Ernest	4x	Slight	Severe	Severe	Slight	Yellow birch--------	60	Red spruce, Norway spruce.
						Red maple-----------	60	
						Black cherry--------	60	
						Red spruce----------	45	
EsE---- Ernest	4x	Moderate	Severe	Severe	Slight	Yellow birch--------	60	Red spruce, Norway spruce.
						Red maple-----------	60	
						Black cherry--------	60	
						Red spruce----------	45	
GcC---- Gilpin	3o	Slight	Slight	Slight	Moderate	Northern red oak----	73	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
						Yellow-poplar-------	95	
GcD---- Gilpin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	80	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
						Yellow-poplar-------	95	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
GcD---------- Gilpin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak---- Yellow-poplar-------	70 90	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
GcE---------- Gilpin (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar-------	80 95	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
GcE---------- Gilpin (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak---- Yellow-poplar-------	70 90	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
GcF---------- Gilpin (North Aspect)	2r	Severe	Severe	Slight	Severe	Northern red oak---- Yellow-poplar-------	80 95	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
GcF---------- Gilpin (South Aspect)	3r	Severe	Severe	Moderate	Moderate	Northern red oak---- Yellow-poplar-------	70 90	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
GdC*: Gilpin----------	3o	Slight	Slight	Slight	Moderate	Northern red oak---- Yellow-poplar-------	73 95	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
Dekalb----------	3f	Slight	Slight	Slight	Moderate	Northern red oak---- White ash----------	70 80	Norway spruce, yellow-poplar, black cherry.
GdE*: Gilpin---------- (North Aspect)	2r	Moderate	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar-------	80 95	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
Dekalb---------- (North Aspect)	2f	Slight	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar-------	76 93	Norway spruce, yellow-poplar, black cherry.
GdE*: Gilpin---------- (South Aspect)	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak---- Yellow-poplar-------	70 90	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
Dekalb---------- (South Aspect)	3f	Slight	Moderate	Moderate	Moderate	Northern red oak---- Yellow-poplar-------	66 75	Eastern white pine, red pine, Virginia pine.
GdF*: Gilpin---------- (North Aspect)	2r	Severe	Severe	Slight	Severe	Northern red oak---- Yellow-poplar-------	80 95	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
GdF*:								
Dekalb (North Aspect)	2f	Moderate	Severe	Slight	Severe	Northern red oak Yellow-poplar	76 93	Norway spruce, yellow-poplar, black cherry.
GdF*:								
Gilpin (South Aspect)	3r	Severe	Severe	Moderate	Moderate	Northern red oak Yellow-poplar	70 90	Japanese larch, Virginia pine, eastern white pine, black cherry, yellow-poplar.
Dekalb (South Aspect)	3f	Moderate	Severe	Moderate	Moderate	Northern red oak Yellow-poplar	66 75	Eastern white pine, red pine, Virginia pine.
GkC*:								
Gilpin	2x	Slight	Moderate	Slight	Severe	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
Dekalb	2x	Slight	Moderate	Slight	Moderate	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
GkE*:								
Gilpin	2r	Moderate	Severe	Slight	Severe	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
Dekalb	2x	Slight	Severe	Slight	Moderate	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
GkF*:								
Gilpin	2r	Severe	Severe	Slight	Severe	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, black cherry, Japanese larch.
Dekalb	2x	Moderate	Severe	Slight	Moderate	Black cherry Red maple White ash Cucumbertree Yellow birch	84 --- --- --- ---	Eastern white pine, red pine, Norway spruce, Japanese larch, eastern white pine.
Ka Kanawha	2o	Slight	Slight	Slight	Severe	Northern red oak Black oak White oak Yellow-poplar White ash Black walnut Black locust	80 80 80 90 80 --- ---	Eastern white pine, yellow-poplar, black walnut, Norway spruce, black locust.
Kv Kanawha Variant	2w	Slight	Slight	Slight	Severe	Northern red oak Black oak White oak Yellow-poplar White ash Black walnut Black locust	80 80 80 90 80 --- ---	Eastern white pine, yellow-poplar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
LeD---- Leetonia	5x	Slight	Severe	Severe	Slight	Red spruce Yellow birch Red maple	35 50 50	Red spruce, Norway spruce.
LyB, LyC---- Lily	4o	Slight	Slight	Slight	Moderate	Northern red oak Virginia pine	60 65	Virginia pine, white oak.
MkC---- Meckesville	2o	Slight	Slight	Slight	Severe	Northern red oak Yellow-poplar	80 90	Eastern white pine, Japanese larch, yellow-poplar, black cherry, Norway spruce.
MkE---- Meckesville	2r	Moderate	Moderate	Slight	Severe	Northern red oak Yellow-poplar	80 90	Eastern white pine, Japanese larch, yellow-poplar, black cherry, Norway spruce.
MoA, MoB---- Monongahela	3w	Slight	Moderate	Slight	Moderate	Northern red oak Yellow-poplar Eastern white pine Virginia pine	70 85 72 77	Eastern white pine, Virginia pine, yellow-poplar, black cherry, Japanese larch.
MoC---- Monongahela	3w	Moderate	Moderate	Slight	Moderate	Northern red oak Yellow-poplar Eastern white pine Virginia pine	70 85 72 77	Eastern white pine, Virginia pine, yellow-poplar, black cherry, Japanese larch.
Ph---- Philo	1w	Slight	Moderate	Slight	Severe	Northern red oak Virginia pine Yellow-poplar	79 74 102	Eastern white pine, yellow-poplar, Norway spruce.
Pm---- Philo Variant	2w	Slight	Slight	Slight	Moderate	Northern red oak Black oak White oak Yellow-poplar White ash Black walnut Black locust	80 80 80 90 80 --- ---	Eastern white pine, yellow-poplar, Norway spruce.
Pn*: Pope----	2o	Slight	Slight	Slight	Severe	Northern red oak Yellow-poplar Eastern white pine Virginia pine	80 102 89 74	Eastern white pine, yellow-poplar, black walnut, black cherry, Norway spruce, Japanese larch.
Atkins----	1w	Slight	Severe	Severe	Severe	Pin oak Red maple American sycamore	86 --- ---	Eastern white pine, Norway spruce.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
Po*:								
Pope	2o	Slight	Slight	Slight	Severe	Northern red oak Yellow-poplar Eastern white pine Virginia pine	80 102 89 74	Eastern white pine, yellow-poplar, black walnut, black cherry, Norway spruce, Japanese larch.
Linden	1o	Slight	Slight	Slight	Severe	Northern red oak White ash Sugar maple Black cherry Black walnut Eastern white pine Yellow-poplar	90 90 90 90 90 90 100	Yellow-poplar, black walnut, black cherry, red pine, Japanese larch, Norway spruce, eastern white pine.
Pv Pope Variant	3s	Slight	Slight	Moderate	Moderate	Northern red oak Yellow-poplar White ash American sycamore Black walnut	70 80 --- --- ---	Eastern white pine, Norway spruce, black walnut.
Py Purdy	1w	Slight	Severe	Severe	Severe	Pin oak Virginia pine Yellow-poplar	85 75 90	Virginia pine, eastern white pine, Norway spruce.
ShC, ShD Shouns	3o	Slight	Slight	Slight	Moderate	Yellow-poplar Virginia pine Eastern white pine Black walnut Northern red oak	80 70 80 --- 80	Yellow-poplar, eastern white pine, black walnut.
Tg Tygart	2w	Slight	Severe	Severe	Severe	Northern red oak Yellow-poplar Red maple White ash Black oak	80 90 --- 80 80	Eastern white pine, Virginia pine, Norway spruce, Japanese larch.
Tv Tygart Variant	2w	Slight	Severe	Severe	Severe	Northern red oak Yellow poplar	80 90	Eastern white pine, yellow-poplar, Virginia pine, Norway spruce, Japanese larch.
WeC Weikert	4d	Slight	Slight	Severe	Slight	Northern red oak Virginia pine	59 56	Virginia pine, red pine, eastern white pine.
WeD Weikert (North Aspect)	4d	Slight	Moderate	Severe	Slight	Northern red oak Virginia pine	64 60	Eastern white pine, Virginia pine.
WeD Weikert (South Aspect)	5d	Slight	Moderate	Severe	Slight	Northern red oak Virginia pine	55 52	Virginia pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
WeE---------- Weikert (North Aspect)	4d	Slight	Moderate	Severe	Slight	Northern red oak----	64	Eastern white pine,
						Virginia pine-------	60	Virginia pine.
WeE---------- Weikert (South Aspect)	5d	Slight	Moderate	Severe	Slight	Northern red oak----	55	Virginia pine.
						Virginia pine-------	52	
ZoB---------- Zoar	3w	Slight	Moderate	Slight	Moderate	Northern red oak----	70	Eastern white pine,
						Yellow-poplar-------	80	Virginia pine,
						Virginia pine-------	70	yellow-poplar,
						Eastern white pine--	80	Japanese larch,
						Black oak-----------	70	Norway spruce.
						White oak-----------	70	
						Red maple-----------	---	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
At Atkins	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
BaB Belmont	Slight	Slight	Moderate: slope.	Slight	Slight.
BaC Belmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BaD Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BaE Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BbC*: Belmont	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
Rock outcrop.					
BbD*: Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
Rock outcrop.					
BbE*, BbF*: Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
BeC Berks	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones.
BeD Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.
BeE, BeF Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
BgC Berks	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones.
BgD Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, smal stones.	Severe: slope, small stones.
BgE, BgF Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BkC*:					
Berks	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones.
Weikert	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, depth to rock, small stones.	Moderate: small stones.	Moderate: slope, small stones, droughty.
BkD*:					
Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope.
Weikert	Severe: slope.	Severe: slope.	Severe: slope, depth to rock, small stones.	Moderate: slope, small stones.	Severe: slope.
BkE*, BkF*:					
Berks	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Weikert	Severe: slope.	Severe: slope.	Severe: slope, depth to rock, small stones.	Severe: slope.	Severe: slope.
Bo Blago	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BrB Brinkerton Variant	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, small stones.
BsC Brinkerton Variant	Severe: wetness, large stones.	Moderate: slope, wetness, large stones.	Severe: slope, wetness, large stones.	Severe: large stones.	Severe: large stones.
BtC*:					
Buchanan	Moderate: slope, wetness.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Severe: large stones.
Ernest	Moderate: slope, wetness.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Severe: large stones.
BtE*:					
Buchanan	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope, large stones.
Ernest	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope, large stones.
CaC Calvin	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope.	Slight	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CaD---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CaE, CaF---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CbB---------- Calvin	Slight----------	Slight----------	Moderate: slope, depth to rock.	Slight----------	Moderate: depth to rock.
CbC---------- Calvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, depth to rock.
CbD---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CbE, CbF---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CcC---------- Calvin	Moderate: slope, large stones.	Moderate: slope, small stones.	Severe: slope.	Moderate: large stones.	Severe: large stones.
CcD---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope, large stones.
CcE, CcF---------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
Ch---------- Chavies	Moderate: floods.	Moderate: small stones.	Severe: small stones.	Moderate: large stones.	Moderate: small stones, large stones.
CoB---------- Cookport Variant	Moderate: percs slowly, wetness.	Slight----------	Moderate: slope, wetness, depth to rock.	Slight----------	Moderate: thin layer, small stones.
CsC---------- Cookport Variant	Severe: large stones.	Moderate: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
DaB---------- Dekalb	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Severe: small stones.
DaC---------- Dekalb	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones.
DaD---------- Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.
DaE, DaF---------- Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
DbB---------- Dekalb	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Severe: small stones.
DbC---------- Dekalb	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DbD--- Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.
DbE, DbF--- Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
DmC--- Dekalb	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Severe: large stones.	Severe: small stones, large stones.
DmE, DmF--- Dekalb	Severe: slope, large stones.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.
DrC--- Dekalb	Severe: large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Severe: large stones.	Severe: small stones, large stones.
DrE, DrF--- Dekalb	Severe: slope, large stones.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.
DsD--- Dekalb	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.	Severe: large stones.	Severe: slope, large stones, small stones.
DsF--- Dekalb	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.	Severe: slope, large stones.	Severe: slope, large stones, small stones.
EnB--- Ernest	Moderate: percs slowly, wetness.	Slight---	Moderate: slope, percs slowly.	Slight---	Slight.
EnC--- Ernest	Moderate: slope, wetness.	Moderate: slope.	Severe: slope.	Slight---	Moderate slope.
EnD--- Ernest	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
EsC--- Ernest	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
EsE--- Ernest	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Fu*: Fluvaquents. Udifluvents.					
GcC--- Gilpin	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: small stones, slope.	Moderate: small stones.	Moderate: slope, depth to rock, small stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GcD---------- Gilpin	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope, small stones.	Severe: slope.
GcE, GcF---------- Gilpin	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.	Severe: slope.
GdC*: Gilpin----------	Moderate: large stones, small stones, slope.	Moderate: large stones, small stones, slope.	Severe: slope, small stones.	Moderate: large stones, small stones.	Moderate: slope, depth to rock, large stones.
Dekalb----------	Moderate: slope, large stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones, large stones.	Severe: large stones, small stones.
GdE*, GdF*: Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Dekalb----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, large stones, small stones.
GkC*: Gilpin----------	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, small stones.	Moderate: large stones, small stones.	Moderate: slope, depth to rock, large stones.
Dekalb----------	Moderate: slope, large stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones, large stones.	Severe: small stones, large stones.
GkE*, GkF*: Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Dekalb----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones, large stones.
Ka---------- Kanawha	Moderate: floods.	Slight----------	Slight----------	Slight----------	Slight.
Kv---------- Kanawha Variant	Moderate: floods.	Slight----------	Moderate: small stones.	Slight----------	Moderate: small stones.
LeD---------- Leetonia	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.
LyB---------- Lily	Slight----------	Slight----------	Moderate: slope, small stones, depth to rock.	Slight----------	Moderate: thin layer.
LyC---------- Lily	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, thin layer.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MkC---------- Meckesville	Moderate: slope, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.
MkE---------- Meckesville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, large stones.	Severe: slope.
Mm*. Medihemists					
MoA---------- Monongahela	Moderate: wetness.	Slight----------	Moderate: wetness.	Slight----------	Slight.
MoB---------- Monongahela	Moderate: wetness.	Slight----------	Moderate: slope, wetness.	Slight----------	Slight.
MoC---------- Monongahela	Moderate: wetness, slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Ph---------- Philo	Severe: floods.	Moderate: floods.	Moderate: floods, wetness.	Slight----------	Moderate: floods.
Pm---------- Philo Variant	Severe: floods.	Slight----------	Moderate: wetness.	Slight----------	Slight.
Pn*: Pope----------	Severe: floods.	Slight----------	Moderate: floods.	Slight----------	Moderate: floods.
Atkins----------	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Po*: Pope----------	Severe: floods.	Slight----------	Moderate: floods.	Slight----------	Moderate: floods.
Linden----------	Severe: floods.	Slight----------	Moderate: floods.	Slight----------	Moderate: floods.
Pv---------- Pope Variant	Severe: floods.	Moderate: small stones.	Moderate: floods, small stones.	Moderate: small stones.	Moderate: floods, small stones.
Py---------- Purdy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Rn*. Rubble land					
ShC---------- Shouns	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slopes.
ShD---------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slopes.
Tg---------- Tygart	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Tv---------- Tygart Variant	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ud*. Udifluvents					
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents					
WeC Weikert	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, depth to rock, small stones.	Moderate: small stones.	Moderate: slope, small stones, droughty.
WeD Weikert	Severe: slope.	Severe: slope.	Severe: slope, depth to rock, small stones.	Moderate: slope, small stones.	Severe: slope.
WeE Weikert	Severe: slope.	Severe: slope.	Severe: slope, depth to rock, small stones.	Severe: slope.	Severe: slope.
ZoB Zoar	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly, wetness.	Slight	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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
At---- Atkins	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
BaB---- Belmont	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaC---- Belmont	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BaD---- Belmont	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BaE---- Belmont	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BbC*, BbD*, BbE*: Belmont----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
BbF*: Belmont----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
BeC---- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BeD---- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BeE---- Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BeF---- Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BgC---- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BgD---- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BgE---- Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BgF---- Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BkC*: 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.
BkD*: Berks----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

TABLE 9.--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
BkD*:										
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BkE*:										
Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BkF*:										
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.
Bo Blago	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BrB Brinkerton Variant	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BsC Brinkerton Variant	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BtC*, BtE*:										
Buchanan	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
Ernest	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CaC Calvin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CaD Calvin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CaE Calvin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CaF Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CbB Calvin	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
CbC Calvin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CbD Calvin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CbE Calvin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CbF, CcC, CcD, CcE, CcF Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Ch Chavies	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.

See footnote at end of table.

TABLE 9.--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
CoB, CsC---------- Cookport Variant	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
DaB---------- Dekalb	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
DaC---------- Dekalb	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
DaD---------- Dekalb	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DaE---------- Dekalb	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DaF---------- Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DbB---------- Dekalb	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
DbC---------- Dekalb	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
DbD---------- Dekalb	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DbE---------- Dekalb	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
DbF---------- Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DmC, DmE, DmF, DrC, DrE, DrF---------- Dekalb	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DsD, DsF---------- Dekalb	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
EnB---------- Ernest	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EnC---------- Ernest	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EnD---------- Ernest	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EsC, EsE---------- Ernest	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Fu*: Fluvaquents.										
Udifluvents.										
GcC---------- Gilpin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.

See footnote at end of table.

TABLE 9.--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
GcD---------- Gilpin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
GcE---------- Gilpin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
GcF---------- Gilpin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
GdC, GdE*, GdF*, GkC*, GkE*, GkF* Gilpin----------	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.
Ka---------- Kanawha	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kv---------- Kanawha Variant	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LeD---------- Leetonia	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
LyB---------- Lily	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LyC---------- Lily	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MkC, MkE---------- Meckesville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Mm*. Medihemists										
MoA---------- Monongahela	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MoB---------- Monongahela	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MoC---------- Monongahela	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ph---------- Philo	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pm---------- Philo Variant	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pn*: Pope----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Atkins----------	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.

See footnote at end of table.

TABLE 9.--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
Po*:										
Pope	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Linden	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pv Pope Variant	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Py Purdy	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Rn*. Rubble land										
ShC Shouns	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ShD Shouns	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Tg Tygart	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Tv Tygart Variant	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ud*. Udifluvents										
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents										
WeC, WeD, WeE Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
ZoB Zoar	Fair	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 10.--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
At Atkins	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: wetness, floods.
BaB Belmont	Moderate: too clayey, depth to rock.	Moderate: low strength, frost action, shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.	Slight.
BaC Belmont	Moderate: slope, too clayey, depth to rock.	Moderate: slope, low strength, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
BaD, BaE Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
BbC*: Belmont	Moderate: slope, large stones, depth to rock.	Moderate: slope, large stones, shrink-swell.	Moderate: slope, large stones, depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, large stones.
Rock outcrop.						
BbD*, BbE*, BbF*: Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Rock outcrop.						
BeC Berks	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Severe: small stones.
BeD, BeE, BeF Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BgC Berks	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Severe: small stones.
BgD, BgE, BgF Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
BkC*: 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.	Severe: small stones, droughty.
BkD*, BkE*, BkF*: Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.

See footnote at end of table.

TABLE 10.--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
BkD*, BkE*, BkF*: Weikert	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.
Bo Blago	Severe: wetness, too clayey.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness.
BrB Brinkerton Variant	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: frost action.	Moderate: wetness, small stones.
BsC Brinkerton Variant	Severe: wetness, large stones.	Severe: frost action, wetness, large stones.	Severe: wetness, large stones.	Severe: slope, wetness, large stones.	Severe: frost action, large stones.	Severe: large stones.
BtC*: Buchanan	Moderate: slope, wetness, large stones.	Moderate: slope, wetness, large stones.	Moderate: slope, wetness, large stones.	Severe: slope.	Moderate: slope, wetness.	Severe: large stones.
Ernest	Moderate: slope, wetness, large stones.	Moderate: slope, wetness, large stones.	Moderate: slope, wetness, large stones.	Severe: slope.	Moderate: slope, wetness.	Severe: large stones.
BtE*: Buchanan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
Ernest	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, large stones.
CaC Calvin	Moderate: slope, depth to rock.	Moderate: slope, frost action.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, low strength, frost action.	Moderate: slope, depth to rock.
CaD, CaE, CaF Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CbB Calvin	Moderate: depth to rock.	Moderate: frost action.	Moderate: depth to rock.	Moderate: frost action.	Moderate: low strength, frost action.	Moderate: depth to rock.
CbC Calvin	Moderate: slope, depth to rock.	Moderate: slope, frost action.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, low strength, frost action.	Moderate: slope, depth to rock.
CbD, CbE, CbF Calvin	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
CcC Calvin	Moderate: slope, depth to rock, large stones.	Moderate: slope, frost action, large stones.	Moderate: slope, depth to rock, large stones.	Severe: slope.	Moderate: slope, frost action, low strength.	Severe: large stones.
CcD, CcE, CcF Calvin	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, large stones.

See footnote at end of table.

TABLE 10.--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
Ch Chavies	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Slight.
CoB Cookport Variant	Severe: depth to rock, wetness.	Moderate: wetness, depth to rock, frost action.	Severe: depth to rock.	Moderate: slope, wetness, depth to rock.	Moderate: depth to rock, wetness, frost action.	Moderate: thin layer, small stones.
CsC Cookport Variant	Severe: depth to rock, wetness, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.
DaB Dekalb	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: small stones.
DaC Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Severe: small stones.
DaD, DaE, DaF Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
DbB Dekalb	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: small stones.
DbC Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Severe: small stones.
DbD, DbE, DbF Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
DmC Dekalb	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones, small stones.
DmE, DmF Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.
DrC Dekalb	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: small stones, large stones.
DrE, DrF Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, small stones, large stones.
DsD, DsF Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, small stones.
EnB Ernest	Moderate: wetness.	Moderate: wetness, low strength, frost action.	Moderate: wetness, low strength.	Moderate: slope, wetness, frost action.	Moderate: wetness, low strength, frost action.	Slight.
EnC Ernest	Moderate: slope, wetness.	Moderate: slope, wetness, low strength.	Moderate: slope, wetness, low strength.	Severe: slope.	Moderate: slope, wetness, frost action.	Moderate: slope.

See footnote at end of table.

TABLE 10.--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
EnD---------- Ernest	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
EsC---------- Ernest	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
EsE---------- Ernest	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Fu*: Fluvaquents.						
Udifluvents.						
GcC---------- Gilpin	Moderate: slope, depth to rock.	Moderate: slope, frost action.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock, small stones.
GcD, GcE, GcF----- Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
GdC*: Gilpin----------	Moderate: slope, depth to rock, large stones.	Moderate: slope, large stones, frost action.	Moderate: slope, depth to rock, large stones.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock, large stones.
Dekalb----------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock, large stones.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Severe: large stones, small stones.
GdE*, GdF*: Gilpin----------	Severe: slope.	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, large stones.	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.
GkC*: Gilpin----------	Severe: depth to rock.	Moderate: slope, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: depth to rock, large stones.
Dekalb----------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock, large stones.	Severe: slope.	Moderate: slope, depth to rock.	Severe: small stones, large stones.
GkE*, GkF*: Gilpin----------	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, large stones.	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.
Ka---------- Kanawha	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength, frost action.	Slight.

See footnote at end of table.

TABLE 10.--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
Kv---------- Kanawha Variant	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength.	Moderate: small stones.
LeD---------- Leetonia	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
LyB---------- Lily	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: thin layer, depth to rock.
LyC---------- Lily	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: slope, thin layer, depth to rock.
MkC---------- Meckesville	Moderate: slope, wetness.	Moderate: slope, frost action, large stones.	Moderate: slope, wetness, large stones.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope, large stones.
MkE---------- Meckesville	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
Mm*. Medihemists						
MoA, MoB---------- Monongahela	Moderate: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
MoC---------- Monongahela	Moderate: slope, wetness.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action.	Moderate: slope.
Ph---------- Philo	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Moderate: floods.
Pm---------- Philo Variant	Moderate: floods, wetness, frost action.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, low strength, frost action.	Slight.
Pn*:						
Pope----------	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
Atkins----------	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: wetness, floods.
Po*:						
Pope----------	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
Linden----------	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
Pv---------- Pope Variant	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, small stones.
Py---------- Purdy	Severe: wetness, too clayey.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.

See footnote at end of table.

TABLE 10.--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
Rn*. Rubble land						
ShC---------- Shouns	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
ShD---------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tg---------- Tygart	Severe: wetness, too clayey.	Severe: low strength, wetness.	Severe: low strength, wetness.	Severe: low strength, wetness.	Severe: low strength.	Moderate: wetness.
Tv---------- Tygart Variant	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Moderate: wetness.
Ud*. Udifluvents						
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents						
WeC---------- Weikert	Severe: depth to rock.	Moderate: slope, depth to rock, frost action.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Severe: small stones, droughty.
WeD, WeE---------- Weikert	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.
ZoB---------- Zoar	Severe: too clayey.	Severe: low strength.	Severe: low strength, wetness.	Severe: low strength.	Severe: low strength.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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
At Atkins	Severe: floods, wetness, percs slowly.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
BaB Belmont	Severe: depth to rock.	Moderate: slope, depth to rock, seepage.	Severe: depth to rock.	Slight	Fair: too clayey, thin layer.
BaC Belmont	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: slope, too clayey, thin layer.
BaD Belmont	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope.
BaE Belmont	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
BbC*: Belmont	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: slope, large stones, too clayey.
Rock outcrop.					
BbD*: Belmont	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope.
Rock outcrop.					
BbE*, BbF*: Belmont	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
Rock outcrop.					
BeC Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
BeD Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
BeE, BeF Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.

See footnote at end of table.

TABLE 11.--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
BgC---------- Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
BgD---------- Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
BgE, BgF---------- Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
BkC*:					
Berks----------	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
Weikert----------	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, small stones.
BkD*:					
Berks----------	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
Weikert----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, small stones.
BkE*, BkF*:					
Berks----------	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
Weikert----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, small stones.
Bo---------- Blago	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness, too clayey.
BrB---------- Brinkerton Variant	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: too clayey.
BsC---------- Brinkerton Variant	Severe: percs slowly, wetness, large stones.	Severe: slope.	Severe: wetness, large stones.	Severe: wetness.	Poor: large stones.
BtC*:					
Buchanan----------	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, large stones.	Moderate: slope, wetness.	Fair: slope, thin layer, large stones.

See footnote at end of table.

TABLE 11.--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
BtC*:					
Ernest	Severe: percs slowly, wetness.	Severe: slope.	Moderate: wetness, large stones.	Moderate: slope, wetness.	Fair: slope, thin layer, large stones.
BtE*:					
Buchanan	Severe: slope, wetness, percs slowly.	Severe: slope.	Moderate: slope, wetness, large stones.	Severe: slope.	Poor: slope.
Ernest	Severe: slope, percs slowly, wetness.	Severe: slope.	Moderate: slope, wetness, large stones.	Severe: slope.	Poor: slope.
CaC---- Calvin	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: area reclaim.
CaD---- Calvin	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, area reclaim.
CaE, CaF---- Calvin	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, area reclaim.
CbB---- Calvin	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: area reclaim.
CbC---- Calvin	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: area reclaim.
CbD---- Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, area reclaim.
CbE, CbF---- Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, area reclaim.
CcC---- Calvin	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: area reclaim.
CcD---- Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, area reclaim.
CcE, CcF---- Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, area reclaim.
Ch---- Chavies	Moderate: floods.	Moderate: floods.	Severe: seepage.	Severe: seepage.	Fair: small stones.
CoB---- Cookport Variant	Severe: wetness, percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock, wetness.	Moderate: wetness.	Poor: depth to rock.

See footnote at end of table.

TABLE 11.--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
CsC---------- Cookport Variant	Severe: depth to rock, wetness, large stones.	Severe: depth to rock.	Severe: large stones, depth to rock, wetness.	Moderate: wetness.	Poor: depth to rock, large stones.
DaB---------- Dekalb	Severe: depth to rock.	Severe: depth to rock, small stones, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
DaC---------- Dekalb	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
DaD---------- Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.
DaE, DaF---------- Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.
DbB---------- Dekalb	Severe: depth to rock.	Severe: depth to rock, small stones, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
DbC---------- Dekalb	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
DbD---------- Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.
DbE, DbF---------- Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.
DmC---------- Dekalb	Severe: depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: large stones, small stones.
DmE, DmF---------- Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, large stones, small stones.
DrC---------- Dekalb	Severe: depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: large stones, small stones.
DrE, DrF---------- Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, large stones, small stones.

See footnote at end of table.

TABLE 11.--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
DsD---- Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, seepage, large stones.	Severe: slope, seepage, large stones.	Poor: slope, large stones, small stones.
DsF---- Dekalb	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, seepage, large stones.	Poor: slope, large stones, small stones.
EnB---- Ernest	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: thin layer.
EnC---- Ernest	Severe: percs slowly, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.	Fair: slope, thin layer.
EnD---- Ernest	Severe: slope, percs slowly, wetness.	Severe: slope.	Moderate: slope, wetness.	Severe: slope.	Poor: slope.
EsC---- Ernest	Severe: percs slowly, wetness, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.	Poor: large stones.
EsE---- Ernest	Severe: slope, percs slowly, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: slope, large stones.	Poor: slope, large stones.
Fu*: Fluvaquents.					
Udifluvents.					
GcC---- Gilpin	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Fair: small stones.
GcD---- Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: slope.	Poor: slope.
GcE, GcF---- Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
GdC*: Gilpin----	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: thin layer, large stones, slope.
Dekalb----	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
GdE*, GdF*: Gilpin----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--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
GdE*, GdF*: Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
GkC*: Gilpin	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Fair: thin layer, large stones, slope.
Dekalb	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
GkE*, GkF*: Gilpin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
Ka Kanawha	Moderate: floods.	Severe: floods.	Moderate: floods.	Moderate: floods.	Good.
Kv Kanawha Variant	Moderate: floods.	Severe: seepage, floods.	Severe: seepage.	Severe: seepage.	Poor: small stones.
LeD Leetonia	Severe: slope, large stones.	Severe: slope, seepage, large stones.	Severe: depth to rock, seepage, large stones.	Severe: slope, seepage, large stones.	Poor: slope, large stones.
LyB Lily	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
LyC Lily	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
MkC Meckesville	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope, large stones.
MkE Meckesville	Severe: slope, percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: slope, wetness.	Poor: slope.
Mm*. Medihemists					
MoA Monongahela	Severe: percs slowly, wetness.	Moderate: seepage.	Moderate: wetness.	Moderate: wetness.	Fair: thin layer.
MoB Monongahela	Severe: percs slowly, wetness.	Moderate: slope, seepage.	Moderate: wetness.	Moderate: wetness.	Fair: thin layer.

See footnote at end of table.

TABLE 11.--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
MoC--Monongahela	Severe: percs slowly, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.	Fair: slope, thin layer.
Ph--Philo	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness, seepage.	Good.
Pm--Philo Variant	Severe: wetness.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
Pn*:					
Pope	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
Atkins	Severe: floods, wetness, percs slowly.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Po*:					
Pope	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
Linden	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: seepage, floods.	Good.
Pv--Pope Variant	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage, wetness.	Severe: floods, seepage.	Poor: small stones.
Py--Purdy	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey.
Rn*. Rubble land					
ShC--Shouns	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope, too clayey.
ShD--Shouns	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
Tg--Tygart	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey.
Tv--Tygart Variant	Severe: wetness, percs slowly.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey.
Ud*. Udifluvents					
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents					

See footnote at end of table.

TABLE 11.--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
WeC---------- Weikert	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, small stones.
WeD---------- Weikert	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, small stones.
WeE---------- Weikert	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, small stones.
ZoB---------- Zoar	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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
At Atkins	Poor: wetness, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BaB Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, small stones.
BaC Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, thin layer, small stones.
BaD Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BaE Belmont	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BbC*: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Rock outcrop.				
BbD*: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Rock outcrop.				
BbE*, BbF*: Belmont	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Rock outcrop.				
BeC Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BeD Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BeE, BeF Berks	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BgC Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BgD Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BgE, BgF Berks	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BkC*:				
Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer, excess fines.	Poor: small stones, thin layer.
BkD*:				
Berks	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer, excess fines.	Poor: slope, small stones, thin layer.
BkE*, BkF*:				
Berks	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Weikert	Poor: slope, depth to rock.	Improbable: small stones.	Improbable: thin layer, excess fines.	Poor: slope, small stones, thin layer.
Bo Blago	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BrB Brinkerton Variant	Poor: frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, small stones.
BsC Brinkerton Variant	Poor: frost action, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
BtC*:				
Buchanan	Fair: frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Ernest	Fair: low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
BtE*:				
Buchanan	Fair: slope, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Ernest	Fair: slope, low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
CaC Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CaD Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CaE, CaF Calvin	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CbB---------- Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
CbC---------- Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, thin layer.
CbD---------- Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CbE, CbF---------- Calvin	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CcC---------- Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
CcD---------- Calvin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
CcE, CcF---------- Calvin	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Ch---------- Chavies	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CoB---------- Cookport Variant	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, small stones.
CsC---------- Cookport Variant	Poor: thin layer, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
DaB, DaC---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
DaD---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
DaE, DaF---------- Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
DbB, DbC---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
DbD---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
DbE, DbF---------- Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
DmC---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, large stones, area reclaim.
DmE, DmF---------- Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DrC---------- Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, large stones, area reclaim.
DrE, DrF---------- Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.
DsD---------- Dekalb	Poor: thin layer, large stones.	Improbable: large stones, excess fines.	Improbable: large stones. excess fines.	Poor: slope, large stones, area reclaim.
DsF---------- Dekalb	Poor: slope, thin layer, large stones.	Improbable: large stones, excess fines.	Improbable: large stones, excess fines.	Poor: slope, large stones, area reclaim.
EnB---------- Ernest	Fair: low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, small stones.
EnC---------- Ernest	Fair: low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, thin layer.
EnD---------- Ernest	Fair: slope, low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
EsC---------- Ernest	Poor: large stones.	Improbable: large stones, excess fines.	Improbable: large stones, excess fines.	Poor: large stones.
EsE---------- Ernest	Poor: large stones.	Improbable: large stones, excess fines.	Improbable: large stones, excess fines.	Poor: slope, large stones.
Fu*: Fluvaquents. Udifluvents.				
GcC---------- Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
GcD---------- Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
GcE, GcF---------- Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
GdC*: Gilpin----------	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Dekalb----------	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, large stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GdE*, GdF*:				
Gilpin	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.
GkC*:				
Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Dekalb	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, large stones, area reclaim.
GkE*, GkF*:				
Gilpin	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Dekalb	Poor: slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.
Ka Kanawha	Fair: low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Kv Kanawha Variant	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
LeD Leetonia	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: slope, large stones, too sandy.
LyB, LyC Lily	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
MkC Meckesville	Fair: frost action, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
MkE Meckesville	Fair: slope, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Mm*. Medihemists				
MoA, MoB Monongahela	Poor: frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
MoC Monongahela	Poor: frost action.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, thin layer.
Ph Philo	Fair: low strength, frost action.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Pm---------- Philo Variant	Fair: low strength, frost action, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Pn*:				
Pope----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Atkins----------	Poor: wetness, frost action.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Po*:				
Pope----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Linden----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Pv---------- Pope Variant	Good----------	Improbable: excess fines, small stones.	Improbable: excess fines.	Poor: too sandy, small stones.
Py---------- Purdy	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Rn*. Rubble land				
ShC---------- Shouns	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
ShD---------- Shouns	Fair: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Tg---------- Tygart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Tv---------- Tygart Variant	Poor: frost action, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Ud*. Udifluvents				
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents				
WeC---------- Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer, excess fines.	Poor: small stones, thin layer.
WeD---------- Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer, exces fines.	Poor: slope, small stones, thin layer.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
WeE---------- Weikert	Poor: slope, depth to rock.	Improbable: small stones.	Improbable: thin layer, excess fines.	Poor: slope, small stones, thin layer.
ZoB---------- Zoar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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	Drainage	Terraces and diversions	Grassed waterways
At---------- Atkins	Severe: seepage.	Severe: seepage, piping, wetness.	Floods, wetness.	Not needed-------	Wetness, floods.
BaB---------- Belmont	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Not needed-------	Favorable--------	Slope, erodes easily.
BaC, BaD, BaE----- Belmont	Severe: slope.	Severe: thin layer.	Not needed-------	Slope----------	Slope, erodes easily.
BbC*, BbD*, BbE*, BbF*: Belmont---------	Severe: slope.	Severe: thin layer.	Not needed-------	Slope, large stones.	Slope, large stones, erodes easily.
Rock outcrop.					
BeC, BeD, BeE, BeF---------- Berks	Severe: seepage, slope.	Severe: thin layer.	Not needed-------	Depth to rock, slope, small stones.	Depth to rock, droughty, slope.
BgC, BgD, BgE, BgF---------- Berks	Severe: seepage, slope.	Severe: piping.	Not needed-------	Depth to rock, slope, small stones.	Depth to rock, droughty, slope.
BkC*, BkD*, BkE*, BkF*: Berks----------	Severe: seepage, slope.	Severe: thin layer.	Not needed-------	Depth to rock, slope, small stones.	Depth to rock, droughty, slope.
Weikert---------	Severe: depth to rock, slope.	Severe: seepage.	Not needed-------	Depth to rock, rooting depth.	Depth to rock, rooting depth, droughty.
Bo---------- Blago	Slight----------	Severe: hard to pack, wetness.	Wetness, percs slowly, poor outlets.	Not needed-------	Wetness, percs slowly.
BrB---------- Brinkerton Variant	Moderate: slope.	Severe: low strength, piping.	Percs slowly-----	Percs slowly, wetness.	Percs slowly, wetness.
BsC---------- Brinkerton Variant	Severe: slope.	Severe: low strength, piping, large stones.	Percs slowly-----	Percs slowly, large stones, wetness.	Percs slowly, large stones, wetness.
BtC*, BtE*: Buchanan---------	Severe: slope.	Severe: piping.	Slope, percs slowly.	Slope, large stones, percs slowly.	Slope, large stones, percs slowly.
Ernest----------	Severe: slope.	Severe: piping.	Slope, percs slowly.	Slope, large stones, percs slowly.	Slope, large stones, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes and levees	Drainage	Terraces and diversions	Grassed waterways
CaC, CaD, CaE, CaF---------- Calvin	Severe: seepage, slope.	Severe: piping.	Not needed-------	Slope, depth to rock.	Slope, depth to rock, droughty.
CbB, CbC, CbD, CbE, CbF---------- Calvin	Severe: slope, seepage.	Severe: thin layer, piping.	Not needed-------	Slope, depth to rock.	Slope, depth to rock.
CcC, CcD, CcE, CcF---------- Calvin	Severe: slope, seepage.	Severe: thin layer, large stones, piping.	Not needed-------	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Ch---------- Chavies	Severe: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
CoB---------- Cookport Variant	Moderate: depth to rock, slope.	Severe: thin layer, piping.	Percs slowly-----	Rooting depth, wetness.	Depth to rock, rooting depth.
CsC---------- Cookport Variant	Severe: slope.	Severe: thin layer, piping, large stones.	Percs slowly-----	Rooting depth, large stones, wetness.	Depth to rock, rooting depth, large stones.
DaB---------- Dekalb	Severe: seepage, depth to rock.	Severe: piping, large stones.	Not needed-------	Slope, depth to rock.	Slope, droughty, depth to rock.
DaC, DaD, DaE, DaF---------- Dekalb	Severe: seepage, slope, depth to rock.	Severe: piping, seepage.	Not needed-------	Slope, depth to rock.	Slope, droughty, depth to rock.
DbB, DbC, DbD, DbE, DbF---------- Dekalb	Severe: seepage, slope, depth to rock.	Severe: piping, seepage.	Not needed-------	Depth to rock----	Droughty, slope, depth to rock.
DmC, DmE, DmF----- Dekalb	Severe: seepage, slope, depth to rock.	Severe: piping, seepage, large stones.	Not needed-------	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
DrC, DrE, DrF----- Dekalb	Severe: slope, seepage.	Severe: piping, seepage, large stones.	Not needed-------	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
DsD, DsF---------- Dekalb	Severe: seepage, large stones.	Severe: piping, seepage, large stones.	Not needed-------	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
EnB---------- Ernest	Moderate: seepage, slope.	Severe: piping.	Slope, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
EnC, EnD---------- Ernest	Severe: slope.	Severe: piping.	Slope, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
EsC, EsE---------- Ernest	Severe: slope, large stones.	Severe: large stones, low strength.	Slope, percs slowly, large stones.	Slope, large stones, percs slowly.	Slope, large stones, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes and levees	Drainage	Terraces and diversions	Grassed waterways
Fu*: Fluvaquents. Udifluvents.					
GcC, GcD, GcE, GcF---- Gilpin	Severe: slope.	Severe: piping.	Not needed----	Slope, depth to rock.	Slope, depth to rock.
GdC*, GdE*, GdF*: Gilpin----	Severe: slope, depth to rock.	Severe: piping.	Not needed----	Slope, depth to rock.	Slope, depth to rock.
Dekalb----	Severe: seepage, depth to rock, slope.	Severe: piping, seepage, large stones.	Not needed----	Slope, depth to rock, large stones.	Slope, rooting depth, large stones.
GkC*, GkE*, GkF*: Gilpin----	Severe: slope, depth to rock.	Severe: large stones, piping.	Not needed----	Slope, depth to rock, large stones.	Slope, depth to rock.
Dekalb----	Severe: slope, depth to rock, seepage.	Severe: piping, seepage, large stones.	Not needed----	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Ka---- Kanawha	Moderate: seepage.	Severe: piping.	Not needed----	Slope, piping.	Slope.
Kv---- Kanawha Variant	Severe: seepage.	Severe: piping.	Not needed----	Favorable----	Favorable.
LeD---- Leetonia	Severe: Depth to rock, seepage, large stones.	Severe: piping, seepage, large stones.	Not needed----	Too sandy, slope, large stones.	Slope, droughty, large stones.
LyB---- Lily	Severe: seepage, depth to rock.	Severe: piping.	Deep to water----	Depth to rock----	Depth to rock.
LyC---- Lily	Severe: seepage, depth to rock, slope.	Severe: piping.	Deep to water----	Slope, depth to rock.	Slope, depth to rock.
MkC, MkE---- Meckesville	Severe: slope.	Severe: piping.	Not needed----	Large stones, slope.	Slope, large stones.
Mm*. Medihemists					
MoA---- Monongahela	Moderate: seepage.	Severe: piping.	Slope, percs slowly.	Percs slowly, piping, rooting depth.	Slope, percs slowly, erodes easily.
MoB---- Monongahela	Moderate: seepage, slope.	Severe: piping.	Slope, percs slowly.	Percs slowly, piping, rooting depth.	Slope, percs slowly, erodes easily.
MoC---- Monongahela	Severe: slope, seepage.	Severe: piping.	Slope, percs slowly.	Percs slowly, piping, rooting depth.	Slope, percs slowly, erodes easily.
Ph---- Philo	Moderate: seepage.	Severe: piping, wetness.	Floods, poor outlets.	Not needed----	Not needed.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes and levees	Drainage	Terraces and diversions	Grassed waterways
Pm---------- Philo Variant	Moderate: seepage.	Severe: low strength, piping.	Favorable--------	Wetness----------	Favorable.
Pn*: Pope----------	Severe: seepage.	Severe: seepage, piping.	Deep to water----	Favorable--------	Droughty.
Atkins----------	Severe: seepage.	Severe: seepage, piping, wetness.	Floods, wetness.	Not needed-------	Wetness, floods.
Po*: Pope----------	Severe: seepage.	Severe: seepage, piping.	Deep to water----	Favorable--------	Droughty.
Linden----------	Severe: seepage.	Severe: piping, seepage.	Not needed-------	Not needed-------	Favorable.
Pv---------- Pope Variant	Severe: seepage.	Severe: seepage.	Not needed-------	Not needed-------	Not needed.
Py---------- Purdy	Slight----------	Severe: piping, hard to pack, wetness.	Percs slowly-----	Wetness----------	Wetness.
Rn*. Rubble land					
ShC, ShD---------- Shouns	Moderate: seepage.	Slight----------	Not needed-------	Slope----------	Slope.
Tg---------- Tygart	Slight----------	Severe: hard to pack, wetness.	Percs slowly-----	Percs slowly, wetness.	Percs slowly, wetness, erodes easily.
Tv---------- Tygart Variant	Slight----------	Severe: piping.	Percs slowly-----	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
Ud*. Udifluvents					
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents					
WeC, WeD, WeE----- Weikert	Severe: depth to rock, slope.	Severe: seepage.	Not needed-------	Depth to rock, rooting depth.	Depth to rock, rooting depth, droughty.
ZoB---------- Zoar	Moderate: depth to rock, slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness, erodes easily.	Erodes easily, slope, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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	
At----------	0-4	Silt loam-------	ML, CL	A-4, A-6	0	90-100	80-100	75-100	60-95	25-40	2-25
Atkins	4-48	Silty clay loam, loam, sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-5	85-100	80-100	50-100	25-85	20-40	1-25
	48-60	Stratified silty clay loam to sandy loam.	SM, SC, GM, ML	A-2, A-4, A-6	0-15	60-100	60-100	50-95	15-85	20-40	1-15
BaB, BaC, BaD, BaE----------	0-8	Silt loam-------	CL, ML, CL-ML	A-4, A-6, A-7	0-5	80-100	75-100	65-100	50-90	25-50	5-25
Belmont	8-31	Silty clay loam, silt loam, clay loam.	ML, CL-ML, CL	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-50	5-25
	31-42	Channery clay loam, channery silty clay loam, channery sandy clay loam.	CL, SC	A-2, A-6, A-7	0-20	40-75	35-70	25-70	15-65	25-50	11-25
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
BbC*, BbD*, BbE*, BbF*:											
Belmont--------	0-8	Stony silt loam.	CL, ML, CL-ML	A-4, A-6, A-7	0-7	80-100	75-100	70-100	50-90	25-50	5-25
	8-31	Silty clay loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-90	25-50	5-25
	31-42	Channery clay loam, channery silty clay loam, channery sandy clay loam.	CL, SC	A-2, A-6, A-7	0-20	40-75	35-70	25-70	15-65	25-50	11-25
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BeC, BeD, BeE, BeF, BgC, BgD, BgE, BgF--------	0-3	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-30	50-80	45-70	40-60	30-55	25-36	5-10
Berks	3-21	Channery loam, very channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	21-35	Channery loam, very channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--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	
BkC*, BkD*, BkE*, BkF*:											
Berks	0-3	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	3-21	Channery loam, very channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	21-35	Channery loam, very channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Weikert	0-6	Shaly silt loam	GM, ML	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	6-16	Shaly loam, very shaly silt loam, cherty loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-45	5-35	5-35	28-36	3-9
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bo Blago	0-16	Silty clay loam	ML, CL	A-4, A-6	0	95-100	90-100	85-100	75-95	25-40	5-15
	16-51	Silty clay, clay, silty clay loam	ML, CL, MH, CH	A-7, A-6	0	95-100	90-100	85-100	75-100	35-60	12-30
	51-72	Silty clay loam, silty clay, shaly clay.	ML, CL, MH, CH	A-7, A-6	0	70-100	60-95	55-95	50-90	30-60	12-30
BrB Brinkerton Variant	0-7	Silt loam	ML	A-4, A-6	0-5	90-100	80-100	75-100	50-80	20-40	2-15
	7-27	Silt loam, channery silty clay loam, clay loam.	ML, CL	A-4, A-6	0-10	75-100	75-100	65-100	55-100	25-40	5-15
	27-60	Shaly silty clay loam, silt loam, loam.	ML, CL, GM, SM	A-4, A-6	0-10	70-90	55-90	50-80	40-75	25-40	5-15
BsC Brinkerton Variant	0-7	Very stony silt loam.	ML, CL	A-4, A-6	3-10	80-100	75-100	75-100	70-100	20-40	2-15
	7-27	Silt loam, channery silty clay loam, clay loam.	ML, CL	A-4, A-6	0-10	75-100	75-100	65-100	55-100	25-40	5-15
	27-60	Shaly silty clay loam, silt loam, loam.	ML, CL, GM, SM	A-4, A-6	0-10	70-90	55-90	50-80	40-75	25-40	5-15
BtC*, BtE*:											
Buchanan	0-10	Stony loam	GM, ML, CL	A-2, A-4	3-20	50-90	45-75	40-75	30-65	---	---
	10-26	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	NP-10
	26-72	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	NP-15

See footnote at end of table.

TABLE 14.--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	
BtC*, BtE*:											
Ernest----------	0-7	Stony silt loam.	ML, CL	A-4, A-6	3-20	65-80	60-80	55-75	55-70	15-40	2-15
	7-24	Silty clay loam, silt loam, channery silt loam.	ML, CL	A-4, A-6, A-7	0-15	75-95	70-95	65-90	55-90	25-50	2-25
	24-54	Channery silt loam, channery loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	55-95	55-90	45-90	20-45	2-25
	54-74	Channery silt loam, silt loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	45-95	45-90	40-90	25-50	2-25
CaC, CaD, CaE, CaF---------- Calvin	0-8	Channery silt loam.	ML, CL	A-4	0-15	70-95	70-90	65-90	55-75	---	---
	8-27	Shaly silt loam, channery loam, very shaly clay loam.	ML, SM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27-34	Shaly silt loam, very shaly silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4	0-20	35-75	30-65	15-60	15-40	23-39	3-13
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CbB, CbC, CbD, CbE, CbF-------- Calvin	0-6	Silt loam-------	ML, CL	A-4	0-5	90-100	70-100	70-100	65-95	20-35	4-10
	6-28	Channery silt loam, channery silty clay loam, shaly silty clay loam.	ML, CL	A-4, A-6, A-7	0-10	65-100	65-95	65-95	60-95	20-45	4-20
	28-36	Very channery silt loam, channery silt loam, shaly silty clay loam.	ML, CL, GC, GM	A-4, A-6	0-20	40-80	40-75	40-75	35-75	20-35	4-15
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
CcC, CcD, CcE, CcF---------- Calvin	0-6	Stony silt loam.	ML, CL	A-4	3-10	70-95	65-90	65-90	60-90	20-35	4-10
	6-28	Channery silt loam, channery silty clay loam, shaly silty clay loam.	ML, CL	A-4, A-6, A-7	0-10	65-100	65-95	65-95	60-95	20-45	4-20
	28-36	Very channery silt loam, channery silt loam, shaly silty clay loam.	ML, CL, GC, GM	A-4, A-6	0-20	40-80	40-75	40-75	35-75	20-35	4-15
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ch---------- Chavies	0-9	Fine sandy loam	SM, ML	A-4, A-2	0-30	75-100	55-100	40-95	25-75	<25	NP-5
	9-50	Fine sandy loam, gravelly fine sandy loam, silt loam.	SM, ML	A-4, A-2	0-5	70-100	60-100	45-100	25-85	<35	NP-8
	50-60	Fine sandy loam, gravelly fine sandy loam, loam.	SM, ML	A-4, A-2	0-5	70-100	60-95	40-85	20-75	<25	NP-5

See footnote at end of table.

TABLE 14.--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	
CoB---------- Cookport Variant	0-8	Silt loam-------	ML, CL	A-4, A-6	0-5	85-100	80-100	75-100	60-90	20-40	1-15
	8-18	Loam, clay loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0-15	80-100	70-100	60-95	45-75	20-40	1-20
	18-30	Loam, clay loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0-15	75-100	60-100	55-95	40-70	20-40	1-20
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CsC---------- Cookport Variant	0-8	Very stony silt loam.	ML, CL	A-4, A-6	5-20	80-100	75-100	70-100	60-90	20-40	1-15
	8-18	Loam, clay loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0-15	80-100	70-100	60-95	45-75	20-40	1-20
	18-30	Loam, clay loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0-15	75-100	60-100	55-95	40-70	20-40	1-20
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DaB, DaC, DaD, DaE, DaF, DbB, DbC, DbD, DbE, DbF---------- Dekalb	0-10	Channery loam---	SM, GM, ML, CL-ML	A-2, A-4	0-30	50-90	45-80	40-75	20-55	15-32	NP-7
	10-26	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	26-33	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DmC, DmE, DmF, DrC, DrE, DrF Dekalb	0-10	Extremely stony loam.	SM, GM, ML, CL-ML	A-2, A-4	10-30	50-90	45-80	40-75	20-55	15-32	NP-7
	10-26	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML	A-2, A-4	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	26-33	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--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	
DsD, DsF--------- Dekalb	0-10	Rubbly loam------	SM, GM, ML, CL-ML	A-2, A-4	50-85	50-90	45-80	40-75	20-55	15-32	NP-7
	10-26	Channery sandy loam, channery loam, very channery sandy loam	SM, GM, ML	A-2, A-4	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	26-33	Channery sandy loam, flaggy sandy loam, very flaggy sandy loam.	SM, GM, SC, GC	A-2, A-4	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
EnB, EnC, EnD---- Ernest	0-7	Silt loam-------	ML, CL	A-4, A-6	0-15	85-100	80-100	70-95	60-95	25-40	2-15
	7-24	Silty clay loam, silt loam, channery silt loam.	ML, CL	A-4, A-6, A-7	0-15	75-95	70-95	65-90	55-90	25-50	2-25
	24-54	Channery silt loam, channery loam, silty clay loam.	ML, CL, GM, SM	A-4, A-6, A-7	0-20	70-95	55-95	55-90	45-90	20-45	2-25
	54-74	Channery silt loam, silt loam, silty clay loam.	ML, CL, GM, SM	A-4, A-6, A-7	0-20	70-95	45-95	45-90	40-90	25-50	2-25
EsC, EsE--------- Ernest	0-7	Rubbly silt loam	ML, CL	A-4, A-6	50-85	65-80	60-80	55-75	55-70	15-40	2-15
	7-24	Silty clay loam, silt loam, channery silt loam.	ML, CL	A-4, A-6, A-7	0-15	75-95	70-95	65-90	55-90	25-50	2-25
	24-54	Channery silt loam, channery loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	55-95	55-90	45-90	20-45	2-25
	54-74	Channery silt loam, silt loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	45-95	45-90	40-90	25-50	2-25
Fu*: Fluvaquents.											
Udifluvents.											

See footnote at end of table.

TABLE 14.--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	
GcC, GcD, GcE, GcF---------- Gilpin	0-8	Channery silt loam.	GM, GC, ML, CL	A-2, A-4, A-6	0-30	50-90	45-85	35-75	30-70	20-40	4-15
	8-21	Channery loam, shaly silt loam, silty clay loam.	GM, GC, CL	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	21-26	Channery loam, very channery silt loam, very shaly silty clay loam.	GM, GC, GM-GC	A-1, A-2, A-4	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GdC*, GdE*, GdF*: Gilpin----------	0-8	Stony silt loam.	GM, GC, ML, CL	A-2, A-4, A-6	10-40	50-90	45-85	35-75	30-70	20-40	4-15
	8-21	Shaly silt loam, channery loam, silty clay loam.	GM, ML, CL, CL-ML	A-2, A-4, A-6	0-30	50-90	45-85	35-75	30-70	20-40	4-15
	21-26	Channery loam, very channery silt loam, very shaly silty clay loam.	GM, GC, GM-GC	A-1, A-2, A-4	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dekalb----------	0-10	Stony loam-------	SM, GM, ML, CL-ML	A-2, A-4	10-30	50-90	45-80	40-75	20-55	15-32	NP-7
	10-26	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML	A-2, A-4	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	26-33	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GkC*, GkE*, GkF*: Gilpin----------	0-8	Stony silt loam.	GM, GC, ML, CL	A-2, A-4, A-6	10-40	50-90	45-85	35-75	30-70	20-40	4-15
	8-21	Shaly silt loam, channery loam, silty clay loam	GM, ML, CL, CL-ML	A-2, A-4, A-6	0-30	50-90	45-85	35-75	30-70	20-40	4-15
	21-26	Channery loam, very channery silt loam, very shaly silty clay loam.	GM, GC, GM-GC	A-1, A-2, A-4	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--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	
Dekalb----------	0-10	Stony loam-------	SM, GM, ML, CL-ML	A-2, A-4	10-30	50-90	45-80	40-75	20-55	15-32	NP-7
	10-26	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML	A-2, A-4	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	26-33	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ka----------	0-9	Loam----------	ML, CL	A-4, A-6	0	80-100	75-100	65-100	50-90	25-40	2-15
Kanawha	9-45	Fine sandy loam, silt loam.	ML, CL, SM, SC	A-4, A-6, A-2	0	80-100	75-100	50-100	30-90	<40	NP-15
	45-72	Fine sandy loam, gravelly fine sandy loam, sandy clay loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	60-100	55-100	40-95	20-60	<40	NP-15
Kv----------	0-9	Gravelly loam---	ML, CL	A-4, A-6	0-10	70-85	60-75	50-70	35-55	25-40	2-15
Kanawha Variant	9-21	Gravelly silt loam, gravelly loam, gravelly sandy clay loam.	ML, CL, GM, GC	A-2, A-4, A-6	0-10	60-85	50-75	40-70	25-65	20-35	2-15
	21-60	Very gravelly sandy loam, very gravelly silt loam, very gravelly loam.	GM, SM, GM-GC SM-SC	A-2, A-4	5-15	30-60	20-50	15-45	10-40	20-35	NP-10
LeD----------	0-11	Rubbly loamy sand.	GW, GM, SW, SM	A-1, A-2	50-85	45-85	35-70	20-55	2-20	---	NP
Leetonia	11-23	Very channery sand, very channery loamy sand.	GW, GM, SW, SM	A-1, A-2	15-50	45-85	35-70	20-55	2-20	---	NP
	23-41	Very channery sand.	GW, GM, SW, SM	A-1	30-40	45-60	35-50	20-35	2-15	---	NP
	41	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LyB, LyC----------	0-13	Loam----------	ML	A-4	0-5	90-100	85-100	70-95	55-75	<35	NP-7
Lily	13-39	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MkC, MkE----------	0-8	Stony silt loam.	ML	A-4	3-10	80-100	70-95	65-85	55-80	---	---
Meckesville	8-29	Loam, channery silt loam, gravelly silty clay loam.	ML, CL	A-4, A-6	0-20	60-100	60-95	60-90	55-70	25-40	2-15
	29-48	Loam, channery silt loam, gravelly clay loam.	ML, CL, GM, SC	A-4, A-2	0-20	45-95	40-90	35-85	30-65	20-30	2-10
	48-60	Loam, channery silt loam, gravelly clay loam.	ML, CL, GM, SC	A-4, A-2	0-50	45-90	30-85	30-85	25-60	20-30	2-10

See footnote at end of table.

TABLE 14.--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	
Mm*. Medihemists											
MoA, MoB, MoC---- Monongahela	0-12	Silt loam-------	ML, SM, CL-ML, SM-SC	A-4	0-5	90-100	85-100	75-100	45-90	20-35	1-10
	12-22	Loam, silt loam, clay loam.	ML, CL	A-4, A-6	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	22-52	Loam, silt loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0-10	80-100	75-100	70-95	45-95	20-40	1-15
	52-60	Cobbly clay loam, loam, sandy loam.	ML, CL, SM, SC	A-4, A-6	5-20	75-100	60-100	60-95	40-95	20-40	1-15
Ph---------- Philo	0-24	Loam----------	ML, SM	A-4	0-5	95-100	75-100	70-90	45-80	20-40	1-10
	24-60	Stratified sand to silt loam.	GM, SM, ML	A-2, A-4	0-5	60-95	50-90	40-85	30-85	20-40	1-10
Pm---------- Philo Variant	0-8	Silt loam-------	ML, CL	A-4, A-6	0	90-100	85-100	75-100	65-90	20-40	2-15
	8-40	Silty clay loam, silt loam, loam.	ML, CL	A-4, A-6	0	85-100	80-100	75-100	60-90	25-40	3-15
	40-60	Fine sandy loam, silt loam, gravelly fine sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-10	60-100	45-100	40-95	30-75	20-40	NP-12
Pn*: Pope----------	0-8	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-1, A-4	0-5	75-100	65-100	40-85	15-55	<20	NP-5
	8-42	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, SM-SC, ML, GM	A-2, A-1, A-4	0-5	55-100	50-100	35-95	15-70	<30	NP-7
	42-60	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, SM-SC, ML, GM	A-2, A-1, A-4	0-20	45-100	35-100	30-95	15-70	<30	NP-7
Atkins----------	0-4	Silt loam-------	ML, CL	A-4, A-6	0	90-100	80-100	75-100	60-95	25-40	2-25
	4-48	Silty clay loam, loam, sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-5	85-100	80-100	50-100	25-85	20-40	1-25
	48-60	Stratified silty clay loam to sandy loam.	SM, SC, GM, ML	A-2, A-4, A-6	0-15	60-100	60-100	50-95	15-85	20-40	1-15
Po*: Pope----------	0-8	Fine sandy loam--	SM, ML, CL-ML, SM-SC	A-2, A-1, A-4	0-5	75-100	65-100	40-85	15-55	<20	NP-5
	8-42	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, SM-SC, ML, GM	A-2, A-1, A-4	0-5	55-100	50-100	35-95	15-70	<30	NP-7
	42-60	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, SM-SC, ML, GM	A-2, A-1, A-4	0-20	45-100	35-100	30-95	15-70	<30	NP-7
Linden----------	0-11	Fine sandy loam	ML, SM	A-4	0	80-100	80-100	65-100	40-90	---	---
	11-26	Silt loam, gravelly loam, sandy loam.	ML, SM	A-4, A-2	0-5	80-100	65-100	40-95	25-90	<30	NP-3
	26-60	Loam, gravelly sandy loam, very gravelly sand.	SM, GM, GP, ML	A-2, A-1, A-3, A-4	0-20	40-100	30-100	15-90	5-75	<25	NP-5

See footnote at end of table.

TABLE 14.--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	
Pv---------- Pope Variant	0-9	Gravelly sandy loam.	SM, SC	A-1, A-2	0-10	65-85	55-75	35-50	15-30	<20	NP-7
	9-60	Very gravelly sand, very gravelly loamy sand, gravelly sandy loam.	SM, SC, GM, GC	A-1, A-2	5-20	40-60	15-45	10-30	5-15	<20	NP-7
Py---------- Purdy	0-9	Silt loam-------	ML, CL	A-4, A-6, A-7	0	95-100	90-100	90-100	90-100	25-50	2-25
	9-42	Silty clay, clay, clay loam.	ML, CL, CH	A-4, A-6, A-7	0	95-100	90-100	85-100	75-85	25-75	2-45
	42-60	Silty clay, clay loam, clay.	ML, CL, CH	A-4, A-6, A-7	0	95-100	90-100	85-100	70-95	25-75	2-45
Rn*. Rubble land											
ShC, ShD---------- Shouns	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	80-100	75-100	65-95	55-90	15-30	3-12
	8-60	Silty clay loam, clay loam.	CL, ML	A-4, A-6	0	80-100	75-100	70-95	60-90	25-40	8-17
Tg---------- Tygart	0-10	Silt loam-------	ML, CL, SM	A-4, A-6	0	95-100	95-100	65-100	40-90	25-40	2-15
	10-46	Silty clay loam, silty clay, clay loam.	CL, CH	A-6, A-7	0	95-100	95-100	85-100	65-95	35-70	15-45
	46-60	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	95-100	95-100	85-100	70-95	35-70	15-45
Tv---------- Tygart Variant	0-10	Silt loam-------	ML, CL	A-4, A-6	0	95-100	95-100	90-100	70-90	25-40	2-15
	10-60	Loam, clay loam, silt loam.	ML, CL	A-4, A-6	0	90-100	85-100	75-95	60-80	25-40	2-15
	60-65	Stratified sand and gravel.	SM, SM-SC, ML, CL-ML	A-1, A-2, A-4	0	60-90	30-80	25-60	5-40	<20	NP-7
Ud*. Udifluvents											
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents											
WeC, WeD, WeE---- Weikert	0-6	Shaly silt loam	GM, ML	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	6-16	Shaly loam, very shaly silt loam, cherty loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-45	5-35	5-35	28-36	3-9
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
ZoB---------- Zoar	0-11	Silt loam-------	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	75-95	20-40	5-20
	11-38	Silty clay, silty clay loam.	CL, CH, ML, MH	A-6, A-7	0	95-100	95-100	90-100	85-100	35-60	11-32
	38-60	Clay loam, silty clay loam, clay.	CL, CH, ML, MH	A-6, A-7	0	95-100	95-100	90-100	75-95	30-70	11-45

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
At----------	0-4	0.6-0.6	0.14-0.22	4.5-5.5	Low----------	0.28	5
Atkins	4-48	0.06-0.6	0.14-0.18	4.5-5.5	Low----------	0.28	
	48-60	0.2-6.0	0.08-0.18	4.5-5.5	Low----------	0.28	
BaB, BaC, BaD, BaE----------	0-8	2.0-6.0	0.16-0.20	5.1-7.3	Moderate-------	0.37	3
Belmont	8-31	0.6-2.0	0.14-0.18	5.1-7.3	Moderate-------	0.28	
	31-42	0.6-2.0	0.12-0.16	5.6-7.8	Moderate-------	0.28	
	42	---	---	---	----------	----	
BbC*, BbD*, BbE*, BbF*:							
Belmont--------	0-8	2.0-6.0	0.16-0.20	5.1-6.5	Moderate-------	0.37	3
	8-31	0.6-2.0	0.14-0.18	5.1-7.3	Moderate-------	0.28	
	31-42	0.6-2.0	0.12-0.16	5.6-7.8	Moderate-------	0.28	
	42	---	---	---	----------	----	
Rock outcrop.							
BeC, BeD, BeE, BeF----------	0-3	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.24	3
Berks	3-21	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	21-35	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	35	---	---	---	----------	----	
BgC, BgD, BgE, BgF----------	0-3	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.28	3
Berks	3-21	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	21-35	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	35	---	---	---	----------	----	
BkC*, BkD*, BkE*, BkF*:							
Berks----------	0-3	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.24	3
	3-21	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	21-35	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17	
	35	---	---	---	----------	----	
Weikert--------	0-6	2.0-6.0	0.08-0.14	4.5-6.0	Low----------	0.28	2
	6-16	2.0-6.0	0.04-0.08	4.5-6.0	Low----------	0.28	
	16	---	---	---	----------	----	
Bo----------	0-16	0.6-2.0	0.18-0.22	4.5-7.3	Low----------	0.43	5
Blago	16-51	0.06-0.6	0.14-0.18	4.5-5.5	Moderate-------	0.28	
	51-72	0.06-0.2	0.10-0.15	4.5-5.5	Moderate-------	0.28	
BrB----------	0-7	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32	3
Brinkerton	7-27	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.32	
Variant	27-60	0.06-0.2	0.08-0.12	4.5-5.5	Low----------	0.28	
BsC----------	0-7	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28	3
Brinkerton	7-27	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.32	
Variant	27-60	0.06-0.2	0.08-0.12	4.5-5.5	Low----------	0.28	
BtC*, BtE*:							
Buchanan--------	0-10	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28	3
	10-26	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28	
	26-72	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.17	
Ernest----------	0-7	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32	3
	7-24	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.28	
	24-54	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
	54-74	0.06-0.6	0.08-0.12	4.5-5.5	Moderate-------	0.28	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
CaC, CaD, CaE, CaF---------- Calvin	0-8	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.24	3
	8-27	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.28	
	27-34	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.28	
	34	---	---	---	----------	----	
CbB, CbC, CbD, CbE, CbF-------- Calvin	0-6	0.6-2.0	0.16-0.20	4.5-6.0	Low----------	0.32	3
	6-28	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-------	0.28	
	28-36	0.6-2.0	0.08-0.12	5.1-6.5	Low----------	0.28	
	36	---	---	---	----------	----	
CcC, CcD, CcE, CcF---------- Calvin	0-6	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.28	3
	6-28	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-------	0.28	
	28-36	0.6-2.0	0.08-0.12	5.1-6.5	Low----------	0.28	
	36	---	---	---	----------	----	
Ch---------- Chavies	0-9	2.0-6.0	0.11-0.18	4.5-6.0	Low----------	0.24	4
	9-50	2.0-6.0	0.11-0.20	4.5-6.0	Low----------	0.24	
	50-60	2.0-6.0	0.11-0.18	4.5-6.0	Low----------	0.24	
CoB---------- Cookport Variant	0-8	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.37	3
	8-18	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28	
	18-30	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
	30	---	---	---	----------	----	
CsC---------- Cookport Variant	0-8	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.32	3
	8-18	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28	
	18-30	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
	30	---	---	---	----------	----	
DaB, DaC, DaD, DaE, DaF-------- Dekalb	0-10	2.0-20	0.08-0.12	4.5-6.5	Low----------	0.24	3
	10-26	2.0-20	0.06-0.12	4.5-5.5	Low----------	0.17	
	26-33	>6.0	0.05-0.10	4.5-5.5	Low----------	0.17	
	33	---	---	---	----------	----	
DbB, DbC, DbD, DbE, DbF-------- Dekalb	0-10	2.0-20	0.08-0.12	4.5-6.5	Low----------	0.24	3
	10-26	2.0-20	0.06-0.12	4.5-5.5	Low----------	0.17	
	26-33	>6.0	0.05-0.10	4.5-5.5	Low----------	0.17	
	33	---	---	---	----------	----	
DmC, DmE, DmF, DrC, DrE, DrF, DsD, DsF-------- Dekalb	0-10	2.0-20	0.08-0.12	4.5-6.5	Low----------	0.24	3
	10-26	2.0-20	0.06-0.12	4.5-5.5	Low----------	0.17	
	26-33	>6.0	0.05-0.10	4.5-5.5	Low----------	0.17	
	33	---	---	---	----------	----	
EnB, EnC, EnD---- Ernest	0-7	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.43	3
	7-24	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.28	
	24-54	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
	54-74	0.06-0.6	0.08-0.12	4.5-5.5	Moderate-------	0.28	
EsC, EsE--------- Ernest	0-7	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28	3
	7-24	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.28	
	24-54	0.06-0.2	0.08-0.12	4.5-5.5	Low----------	0.28	
	54-74	0.06-0.2	0.08-0.12	4.5-5.5	Moderate-------	0.28	
Fu*: Fluvaquents.							
Udifluvents.							

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
GcC, GcD, GcE, GcF----------	0-8	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28	3
Gilpin	8-21	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28	
	21-26	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28	
	26	---	---	---	----------	----	
GdC*, GdE*, GdF*, GkC*, GkE*, GkF*:							
Gilpin---------	0-8	0.6-2.0	0.08-0.14	4.5-5.5	Low----------	0.28	3
	8-21	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28	
	21-26	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28	
	26	---	---	---	----------	----	
Dekalb---------	0-10	2.0-20	0.08-0.12	4.5-6.5	Low----------	0.24	3
	10-26	2.0-20	0.06-0.12	4.5-5.5	Low----------	0.17	
	26-33	>6.0	0.05-0.10	4.5-5.5	Low----------	0.17	
	33	---	---	---	----------	----	
Ka----------	0-9	0.6-2.0	0.16-0.22	5.1-6.0	Low----------	0.32	4
Kanawha	9-45	0.6-2.0	0.12-0.20	5.1-6.0	Low----------	0.32	
	45-72	0.6-6.0	0.10-0.18	5.1-6.0	Low----------	0.24	
Kv----------	0-9	0.6-6.0	0.12-0.14	5.1-6.0	Low----------	0.28	4
Kanawha Variant	9-21	0.6-6.0	0.10-0.14	5.1-6.0	Low----------	0.24	
	21-60	2.0-20.0	0.04-0.08	5.1-6.0	Low----------	0.17	
LeD----------	0-11	6.0-20.0	0.03-0.05	4.5-5.0	Low----------	0.17	3
Leetonia	11-23	2.0-6.0	0.03-0.05	4.5-5.0	Low----------	0.17	
	23-41	6.0-20.0	0.02-0.04	3.6-5.0	Low----------	0.17	
	41	---	---	---	----------	----	
LyB, LyC---------	0-13	0.6-6.0	0.13-0.18	4.5-5.5	Low----------	0.28	3
Lily	13-39	2.0-6.0	0.12-0.18	4.5-5.5	Low----------	0.28	
	39	---	---	---	----------	----	
MkC, MkE---------	0-8	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28	4
Meckesville	8-29	0.6-2.0	0.10-0.14	4.5-5.5	Low----------	0.28	
	29-48	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
	48-60	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.28	
Mm*. Medihemists							
MoA, MoB, MoC----	0-12	0.6-2.0	0.18-0.24	4.5-5.5	Low----------	0.43	3
Monongahela	12-22	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.43	
	22-52	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.43	
	52-60	0.2-0.6	0.08-0.12	4.5-5.5	Low----------	0.43	
Ph----------	0-24	0.2-2.0	0.12-0.20	4.5-5.5	Low----------	----	---
Philo	24-60	2.0-20.0	0.06-0.10	4.5-5.5	Low----------	----	
Pm----------	0-8	0.6-2.0	0.16-0.22	5.1-6.0	Low----------	0.32	4
Philo Variant	8-40	0.6-2.0	0.14-0.18	5.1-6.0	Low----------	0.32	
	40-60	0.6-6.0	0.10-0.18	5.1-6.0	Low----------	0.24	
Pn*:							
Pope----------	0-8	2.0-6.0	0.14-0.18	4.5-5.5	Low----------	0.28	5
	8-42	0.6-6.0	0.14-0.18	4.5-5.5	Low----------	0.28	
	42-60	0.6-6.0	0.05-0.08	4.5-5.5	Low----------	0.28	
Atkins----------	0-4	0.6-2.0	0.14-0.22	4.5-5.5	Low----------	0.28	5
	4-48	0.06-0.6	0.14-0.18	4.5-5.5	Low----------	0.28	
	48-60	0.2-6.0	0.08-0.18	4.5-5.5	Low----------	0.28	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
Po*:							
Pope	0-8	2.0-6.0	0.14-0.18	3.6-5.5	Low	0.28	5
	8-42	0.6-6.0	0.14-0.18	3.6-5.5	Low	0.28	
	42-60	0.6-6.0	0.05-0.08	3.6-5.5	Low	0.28	
Linden	0-11	2.0-6.0	0.14-0.18	5.1-6.0	Low	0.49	4
	11-26	0.6-6.0	0.14-0.18	5.1-6.0	Low	0.64	
	26-60	6.0-20	0.05-0.08	5.1-6.0	Low	0.17	
Pv	0-9	>6.0	0.04-0.10	5.1-7.3	Low	0.20	5
Pope Variant	9-60	>6.0	0.04-0.08	5.1-7.3	Low	0.17	
Py	0-9	0.2-0.6	0.18-0.24	3.6-5.5	Moderate	0.43	3
Purdy	9-42	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28	
	42-60	0.06-0.2	0.10-0.16	3.6-5.5	Moderate	0.28	
Rn*.							
Rubble land							
ShC, ShD	0-8	0.6-2.0	0.13-0.20	5.1-6.0	Low	0.24	5
Shouns	8-60	0.6-2.0	0.12-0.18	5.1-6.0	Low	0.28	
Tg	0-10	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.43	3
Tygart	10-46	0.06-0.2	0.10-0.14	4.5-5.5	Moderate	0.28	
	46-60	0.06-0.2	0.10-0.14	4.5-5.5	Moderate	0.28	
Tv	0-10	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.43	3
Tygart Variant	10-60	0.06-0.2	0.12-0.16	4.5-5.5	Low	0.43	
	60-65	>6.0	0.04-0.10	4.5-5.5	Low	0.20	
Ud*.							
Udifluvents							
U1*, U2*, U3*, U4*, U5*, U6*.							
Udorthents							
WeC, WeD, WeE	0-6	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.28	2
Weikert	6-16	2.0-6.0	0.04-0.08	4.5-6.0	Low	0.28	
	16	---	---	---	---	----	
ZoB	0-11	0.6-2.0	0.15-0.18	4.5-5.5	Low	0.43	3
Zoar	11-38	0.06-0.6	0.12-0.15	4.5-5.5	Moderate	0.28	
	38-60	0.06-0.2	0.08-0.12	4.5-5.5	Moderate	0.28	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." 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	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
				Ft			In				
At---------- Atkins	D	Common------	Very brief	0-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Moderate.
BaB, BaC, BaD, BaE---------- Belmont	B	None--------	---	>6.0	---	---	40-60	Hard	Moderate	Moderate	Moderate.
BbC*, BbD*, BbE* BbF*:											
Belmont---------	B	None--------	---	>6.0	---	---	40-60	Hard	Moderate	Moderate	Moderate.
Rock outcrop.											
BeC, BeD, BeE, BeF, BgC, BgD, BgE, BgF--------- Berks	C	None--------	---	>6.0	---	---	20-40	Soft	Low------	Low------	High.
BkC*, BkD*, BkE*, BkF*:											
Berks-----------	C	None--------	---	>6.0	---	---	20-40	Soft	Low------	Low------	High.
Weikert---------	C/D	None--------	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
Bo---------- Blago	D	None--------	---	0-1.0	Apparent	Jan-Apr	>60	---	High-----	High-----	High.
BrB, BsC---------- Brinkerton Variant	C	None--------	---	0.5-1.5	Perched	Oct-May	>60	---	High-----	High-----	High.
BtC*, BtE*:											
Buchanan---------	C	None--------	---	1.5-3.0	Perched	Nov-Mar	>60	---	Moderate	High-----	High.
Ernest-----------	C	None--------	---	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	Moderate	Moderate.
CaC, CaD, CaE, CaF, CbB, CbC, CbD, CbE, CbF, CcC, CcD, CcE, CcF---------- Calvin	C	None--------	---	>6.0	---	---	20-40	Soft	Moderate	Low------	Moderate.
Ch---------- Chavies	B	None to rare	---	>6.0	---	---	>60	---	Low------	Low------	Moderate.
CoB, CsC---------- Cookport Variant	C	None--------	---	1.5-2.5	Perched	Dec-Apr	20-40	Hard	Moderate	Moderate	Moderate.

See footnote at end of table.

TABLE 16.--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	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
				Ft			In				
DaB, DaC, DaD, DaE, DaF, DbB, DbC, DbD, DbE, DbF, DmC, DmE, DmF, DrC, DrE, DrF, DsD, DsF---- Dekalb	C	None--------	---	>6.0	---	---	20-40	Hard	Low------	Low------	High.
EnB, EnC, EnD, EsC, EsE---------- Ernest	C	None--------	---	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	Moderate	Moderate.
Fu*: Fluvaquents.											
Udifluvents.											
GcC, GcD, GcE, GcF---------- Gilpin	C	None--------	---	>6.0	---	---	20-40	Soft	Moderate	Low------	High.
GdC*, GdE*, GdF*, GkC*, GkE*, GkF*:											
Gilpin----------	C	None--------	---	>6.0	---	---	20-40	Soft	Moderate	Low------	High.
Dekalb----------	C	None--------	---	>6.0	---	---	20-40	Hard	Low------	Low------	High.
Ka---------- Kanawha	B	Rare--------	---	>6.0	---	---	>72	---	Moderate	Low------	Moderate.
Kv---------- Kanawha Variant	B	Rare--------	---	>6.0	---	---	>60	---	Low------	Low------	Moderate.
LeD---------- Leetonia	C	None--------	---	>6.0	---	---	>40	Hard	Low------	Low------	High.
LyB, LyC---------- Lily	B	None--------	---	>6.0	---	---	20-40	Hard	Low------	Moderate	High.
MkC, MkE---------- Meckesville	C	None--------	---	2.5-3.5	Perched	Nov-Apr	>60	---	Moderate	Moderate	High.
Mm*. Medihemists											
MoA, MoB, MoC----- Monongahela	C	None--------	---	1.5-3.0	Perched	Dec-Apr	>60	---	High-----	High-----	High.
Ph---------- Philo	B	Common------	---	1.5-3.0	Apparent	Dec-Apr	>40	Hard	Moderate	Low------	High.
Pm---------- Philo Variant	B	Rare--------	---	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	Low------	Moderate.

See footnote at end of table.

TABLE 16.--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	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
				Ft			In				
Pn*: Pope	B	Common	Very brief	4.0-6.0	---	---	>60	---	Moderate	Low	High.
Atkins	D	Common	Very brief	0-1.0	Apparent	Nov-Jun	>60	---	High	High	Moderate.
Po*: Pope	B	Common	Very brief	4.0-6.0	---	---	>60	---	Moderate	Low	High.
Linden	B	Common	Very brief to brief.	3.0-6.0	Apparent	Nov-Mar	>60	---	Moderate	Low	High.
Pv Pope Variant	A	Common	Very brief	>4.0	Apparent	Jan-Apr	>60	---	Low	Low	High.
Py Purdy	D	None	---	0-1.5	Apparent	Nov-Jun	>60	---	High	High	High.
Rn*. Rubble land											
ShC, ShD Shouns	B	None	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Tg Tygart	D	None	---	0.5-1.5	Apparent	Dec-May	>60	---	Moderate	High	High.
Tv Tygart Variant	C	None	---	0.5-1.5	Perched	Dec-Apr	>60	---	High	High	High.
Ud*. Udifluvents											
U1*, U2*, U3*, U4*, U5*, U6*. Udorthents											
WeC, WeD, WeE Weikert	C/D	None	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
ZoB Zoar	C	None	---	1.5-2.5	Perched	Dec-Apr	>48	---	Moderate	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--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
Atkins	Fine-loamy, mixed, acid, mesic Typic Fluvaquents
Belmont	Fine-loamy, mixed, mesic Typic Hapludalfs
Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Blago	Clayey, mixed, mesic Typic Umbraquults
Brinkerton Variant	Fine-loamy, mixed, mesic Aeric Fragiaquults
Buchanan	Fine-loamy, mixed, mesic Aquic Fragiudults
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
*Chavies	Coarse-loamy, mixed, mesic Ultic Hapludalfs
Cookport Variant	Fine-loamy, mixed, mesic Aquic Hapludults
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Ernest	Fine-loamy, mixed, mesic Aquic Fragiudults
Gilpin	Fine-loamy, mixed, mesic Typic Hapludults
*Kanawha	Fine-loamy, mixed, mesic Typic Hapludalfs
Kanawha Variant	Fine-loamy, mixed, mesic Ultic Hapludalfs
*Leetonia	Sandy-skeletal, siliceous, mesic Entic Haplorthods
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Linden	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Meckesville	Fine-loamy, mixed, mesic Typic Fragiudults
Monongahela	Fine-loamy, mixed, mesic Typic Fragiudults
Philo	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Philo Variant	Fine-loamy, mixed, mesic Ultic Hapludalfs
Pope	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Pope Variant	Sandy-skeletal, mixed, mesic Typic Udifluvents
Purdy	Clayey, mixed, mesic Typic Ochraquults
Shouns	Fine-loamy, mixed, mesic Typic Hapludults
Tygart	Clayey, mixed, mesic Aeric Ochraquults
Tygart Variant	Fine-loamy, mixed, mesic Aeric Ochraquults
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Zoar	Clayey, mixed, mesic Aquic Hapludults

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