United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with The Pennsylvania State University, College of Agricultural Sciences; the Pennsylvania Department of Agriculture; and the Pennsylvania Department of Environmental Protection

Soil Survey of Fulton County, Pennsylvania

How to Use This Soil Survey

General Soil Map

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

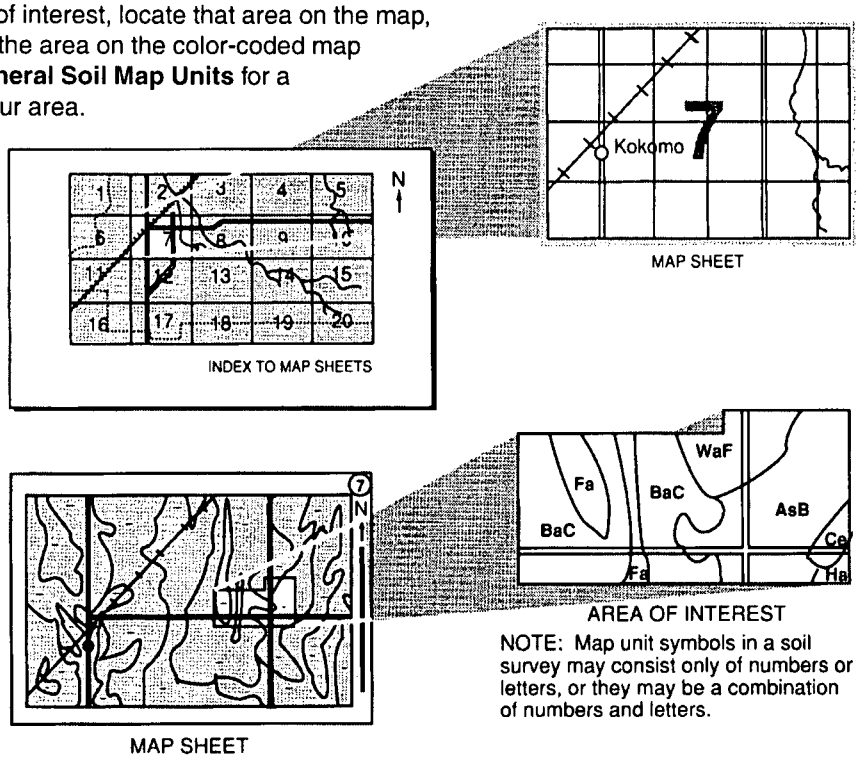
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

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

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

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



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

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

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

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This survey was made cooperatively by the Natural Resources Conservation Service, U.S. Department of Agriculture; The Pennsylvania State University, College of Agricultural Sciences; the Pennsylvania Department of Agriculture; and the Pennsylvania Department of Environmental Protection. The survey is part of the technical assistance furnished to the Fulton County 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: Typical landscape in Fulton County, Pennsylvania. Dekalb and Hazleton soils are on the upper slopes of the ridge in the background, and Sideling and Buchanan soils are on the lower slopes. In the foreground are Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes.

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

Contents

How to Use This Soil Survey 3
Foreword 9
General Nature of the County 12
Physiography 12
Geology 12
Mineral Resources 12
Water Resources 13
Climate 13
How This Survey Was Made 14
General Soil Map Units 17
Soil descriptions 17
1. Berks-Weikert 17
2. Calvin-Klinesville 18
3. Hagerstown 20
4. Hazleton-Sideling-Dekalb 20
5. Laidig-Buchanan 21
6. Murrill-Clarksburg 24
7. Wurno-Nollville 24
Detailed Soil Map Units 27
Soil descriptions 28
AgB—Allegheny loam, 3 to 8 percent slopes 28
AnB—Andover gravelly loam, 3 to 8 percent slopes 28
AoB—Andover gravelly loam, 0 to 8 percent slopes, very stony 29
As—Atkins silt loam 29
Be—Barbour fine sandy loam 30
Bf—Basher fine sandy loam 31
BhB—Bedington channery silt loam, 3 to 8 percent slopes 31
BhC—Bedington channery silt loam, 8 to 15 percent slopes 31
BhD—Bedington channery silt loam, 15 to 25 percent slopes 32
BkB—Berks channery silt loam, 3 to 8 percent slopes 32
BkC—Berks channery silt loam, 8 to 15 percent slopes 33
BkD—Berks channery silt loam, 15 to 25 percent slopes 33
BrA—Brinkerton silt loam, 0 to 3 percent slopes 34
BrB—Brinkerton silt loam, 3 to 8 percent slopes 34
BuB—Buchanan gravelly loam, 3 to 8 percent slopes 34
BuC—Buchanan gravelly loam, 8 to 15 percent slopes 35
BxB—Buchanan cobbly loam, 0 to 8 percent slopes, extremely stony 35
BxD—Buchanan cobbly loam, 8 to 25 percent slopes, extremely stony 36
CaB—Calvin channery loam, 3 to 8 percent slopes 36
CaC—Calvin channery loam, 8 to 15 percent slopes 37
CaD—Calvin channery loam, 15 to 25 percent slopes 37
CkB—Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes 38
CoC—Carbo silty clay loam, 8 to 15 percent slopes 38
CoD—Carbo silty clay loam, 15 to 25 percent slopes 39
CrC—Cedarcreek very channery loam, 3 to 25 percent slopes 40
CrF—Cedarcreek extremely channery loam, 25 to 80 percent slopes 40
CsB—Clarksburg silt loam, 3 to 8 percent slopes 41
DEF—Dekalb and Hazleton soils, 25 to 75 percent slopes, rubbly 42
EgB—Elliber very channery silt loam, 3 to 8 percent slopes 42
EgC—Elliber very channery silt loam, 8 to 15 percent slopes 43
EgD—Elliber very channery silt loam, 15 to 25 percent slopes 43
ErB—Ernest silt loam, 3 to 8 percent slopes 43
FrB—Frankstown channery silt loam, 3 to 8 percent slopes 44
FrC—Frankstown channery silt loam, 8 to 15 percent slopes 44
FrD—Frankstown channery silt loam, 15 to 25 percent slopes 44
FrE—Frankstown channery silt loam, 25 to 35 percent slopes 45

Fu—Funkstown silt loam 46
HaB—Hagerstown silt loam, 3 to 8 percent slopes 46
HaC—Hagerstown silt loam, 8 to 15 percent slopes 46
HbB—Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes 47
HkE—Hagerstown-Rock outcrop complex, 8 to 35 percent slopes 48
HOD—Hazleton and Clymer soils, 8 to 25 percent slopes, extremely stony 48
HRB—Hazleton and Dekalb soils, 0 to 8 percent slopes, extremely stony 49
HRD—Hazleton and Dekalb soils, 8 to 25 percent slopes, extremely stony 50
HRF—Hazleton and Dekalb soils, 25 to 75 percent slopes, extremely stony 50
HwB—Hustontown silt loam, 3 to 8 percent slopes 51
Jg—Jugtown-Lindside silt loams 51
KaB—Klinesville channery silt loam, 3 to 8 percent slopes 52
KaC—Klinesville channery silt loam, 8 to 15 percent slopes 52
KaD—Klinesville channery silt loam, 15 to 25 percent slopes 53
KWF—Klinesville and Weikert soils, 25 to 60 percent slopes 53
LaB—Laidig gravelly loam, 3 to 8 percent slopes 54
LaC—Laidig gravelly loam, 8 to 15 percent slopes 54
LbB—Laidig gravelly loam, 0 to 8 percent slopes, extremely stony 54
LbD—Laidig gravelly loam, 8 to 25 percent slopes, extremely stony 55
LCE—Laidig and Hazleton soils, 25 to 60 percent slopes, extremely stony 55
Ln—Lindside silt loam 56
Me—Melvin silt loam 56
MoB—Monongahela silt loam, 3 to 8 percent slopes 57
MrB—Murrill gravelly loam, 3 to 8 percent slopes 57
MrC—Murrill gravelly loam, 8 to 15 percent slopes 57
MvD—Murrill gravelly loam, 8 to 25 percent slopes, extremely stony 58
PcB—Pecktonville gravelly silt loam, 3 to 8 percent slopes 59
PcC—Pecktonville gravelly silt loam, 8 to 15 percent slopes 59
PeE—Pecktonville-Rock outcrop complex, 25 to 45 percent slopes 59
Pg—Penlaw silt loam, 0 to 3 percent slopes 60
Ph—Philo silt loam 60
Po—Pope silt loam 61
Pu—Purdy silty clay loam 61
Q—Quarries 61
SeB—Sideling gravelly loam, 3 to 8 percent slopes 62
SeC—Sideling gravelly loam, 8 to 15 percent slopes 62
SeD—Sideling gravelly loam, 15 to 25 percent slopes 62
SrB—Sideling gravelly loam, 0 to 8 percent slopes, extremely stony 63
SrD—Sideling gravelly loam, 8 to 25 percent slopes, extremely stony 63
SSF—Sideling and Hazleton soils, 25 to 60 percent slopes, extremely stony 64
Ty—Tyler silt loam, 0 to 3 percent slopes 64
Uu—Urban land-Udorthents complex, 0 to 25 percent slopes 64
WeB—Weikert channery silt loam, 3 to 8 percent slopes 65
WeC—Weikert channery silt loam, 8 to 15 percent slopes 66
WeD—Weikert channery silt loam, 15 to 25 percent slopes 66
WuB—Wurno-Nollville channery silt loams, 3 to 8 percent slopes 66
WuC—Wurno-Nollville channery silt loams, 8 to 15 percent slopes 67
WuD—Wurno-Nollville channery silt loams, 15 to 25 percent slopes 67
WuE—Wurno-Nollville channery silt loams, 25 to 45 percent slopes 68

Use and Management of the Soils 69
Crops and Pasture 69
Yields per Acre 70
Land Capability Classification 71
Prime Farmland 71
Forestland Management and Productivity 72
Recreation 74
Wildlife Habitat 75
Engineering 77
Building Site Development 77
Sanitary Facilities 78
Construction Materials 79
Water Management 80
Soil Properties 83
Engineering Index Properties 83
Physical and Chemical Properties 84
Soil and Water Features 85
Hydric Soils 86
Classification of the Soils 89
Soil Series and Their Morphology 89
Allegheny Series 89
Andover Series 90
Atkins Series 91
Barbour Series 92
Basher Series 93
Bedington Series 94
Berks Series 95
Brinkerton Series 95
Buchanan Series 96
Calvin Series 98
Carbo Series 98
Cedarcreek Series 99
Clarksburg Series 100
Clymer Series 101
Dekalb Series 102
Elliber Series 103
Ernest series 104
Frankstown Series 105
Funkstown Series 106
Hagerstown Series 106
Hazleton Series 107
Hustontown Series 108
Jugtown Series 109
Klinesville Series 110
Laidig Series 111
Leck Kill Series 112
Lindside Series 113
Melvin Series 114
Monongahela Series 115
Murrill Series 116
Nollville Series 117
Pecktonville Series 118
Penlaw Series 119
Philo Series 120
Pope Series 120
Purdy Series 121
Sideling Series 122
Tyler Series 124
Weikert Series 124
Wurno Series 125
Formation of the Soils 127
Factors of Soil Formation 127
Parent Material 127
Relief 127
Climate 128
Plant and Animal Life 128
Time 128
Processes of Soil Formation 128
References 129
Glossary 131
Tables 143
Table 1.—Temperature and Precipitation 144
Table 2.—Freeze Dates in Spring and Fall 145
Table 3.—Growing Season 145
Table 4.—Acreage and Proportionate Extent of the Soils 146
Table 5.—Land Capability and Yields per Acre of Crops and Pasture 148
Table 6.—Prime Farmland 153
Table 7.—Forestland Management and Productivity 154
Table 8.—Recreational Development 164
Table 9.—Wildlife Habitat 172
Table 10.—Building Site Development 178
Table 11.—Sanitary Facilities 186
Table 12.—Construction Materials 195
Table 13.—Water Management 203
Table 14.—Engineering Index Properties 211

Table 15.—Physical and Chemical Properties of the Soils 234
Table 16.—Soil Features 243
Table 17.—Water Features 248
Table 18.—Hydric Soil Map Units with Hydric Inclusions 253
Table 19.—Classification of the Soils 260

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

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

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

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

Janet L. Oertly
State Conservationist
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Soil Survey of
Fulton County, Pennsylvania

By William R. Knight, Natural Resources Conservation Service

Fieldwork by William R. Knight and Ned B. Ellenberger,
Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
The Pennsylvania State University, College of Agricultural Sciences; the Pennsylvania Department of Agriculture; and the Pennsylvania Department of Environmental Protection

Fulton County is located in the south-central part of Pennsylvania (fig. 1). It has a surface area of 278,400 acres, about 435 square miles. It is about 15 miles wide from east to west and 29 miles long. It is crossed east to west by U.S. 30 and Pennsylvania Interstate 76 and from north to south by U.S. 522 and Pennsylvania

Fulton County is bordered by Bedford County to the west, Huntingdon County to the north, Franklin County to the east, and Allegany County, Maryland, and Washington County, Maryland to the south. McConnellsburg, both the largest town in the county and the county seat, is in the east-central part of the county. McConnellsburg is 140 miles from Pittsburgh and 175 miles from Philadelphia.

The first settlers likely arrived in Tonoloway Creek Valley in the southern part of Fulton County about 1735. Later, groups of settlers arrived in the Great Cove and in the northern parts of the county on land that had not yet been secured from Indians. In 1741-2, a settlement attempted near the present site of Burnt Cabins was considered illegal. In 1750, the Pennsylvania colonial government ordered the burning of the settlement to pacify the Indians. However, 5 years later, the Indians attacked settlers in the "Great Cove Massacre." In 1755, Fort Littleton was built as part of a chain of forts to protect settlers from Indian attacks, and Forbes Road was opened through the northern part of the county.

The early Scotch-Irish settled at Big Cove, and the English and French settled in some shale valleys. In 1777 the first school was built in Big Spring, south of the present town of McConnellsburg.

The area now known as Fulton County underwent rapid development. It was part of Cumberland County until 1771, when it made up the eastern part of Bedford County. In 1850, Fulton County, named in honor of Robert Fulton, was established.

During the Civil War Confederate soldiers occupied parts of Fulton County and twice raided McConnellsburg. The last time Confederate soldiers bivouacked north of the Mason-Dixon line was in Fulton County in 1864.

In 1990, the population of Fulton County was 13,837, and that of McConnellsburg, the largest town and the county seat, was 1,106.

Fulton County is mainly agricultural. Dairying is the main farm enterprise. Other types of farming include beef, poultry, hogs, sheep, fruit, and grain. Lumber and pulpwood for paper manufacturing are the main woodland products. Some small manufacturing companies produce industrial machinery, clothing, hardware, and appliances. Most limestone products are quarried in the Warfordsburg area. Many county residents work in adjoining counties.

This soil survey supersedes the soil survey of Fulton County published in 1969 (USDA, 1969). It provides updated, additional information. The soil maps have been digitized and can be used in a Geographic Information System (GIS).

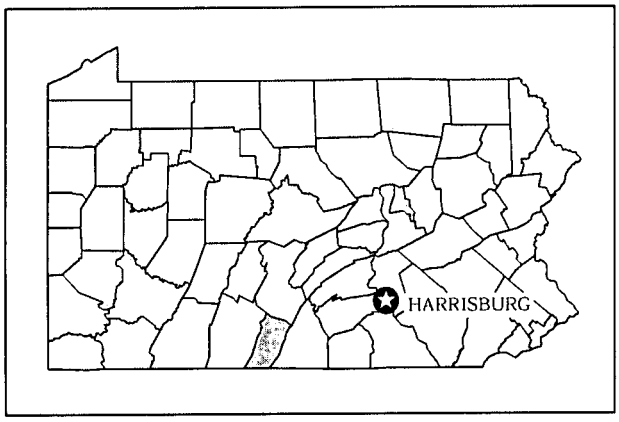

Figure 1.—Location of Fulton County in Pennsylvania.

General Nature of the County

B.A. Benton, geologist, and W.R. Knight, soil scientist, both of the Natural Resources Conservation Service, helped to prepare this section.

This section gives general information about the physiography, geology, mineral resources, water resources, and climate of Fulton County, Pennsylvania.

Physiography

Fulton County lies within the Appalachian Mountain section of the Valley and Ridge Physiographic Province. This province has long, narrow ridges and valleys with a northeast-southwest orientation.

Three major landforms comprise the survey area: mountainous ridges, intermountain valleys, and moderately rolling uplands. The steep, high, generally narrow, mountainous ridges run northeast-southwest. Large amounts of colluvial material are at their bases. The rolling intermountain valleys are underlain by shale. And, in the vicinity of McConnellsburg, the moderately rolling uplands are underlain by limestone. Typically, the major ridges are 2,200 feet above mean sea level (m.s.l.), and the valley uplands are 1,000 to 1,400 feet above m.s.l.. The highest point in the county, the crest of Big Mountain, part of Tuscarora Mountain, is 2,458 feet above m.s.l.. The lowest point, Tonoloway Creek along the Fulton County-Maryland border, is 430 feet above m.s.l..

Geology

The rocks of the county are sedimentary, and range in age from Cambrian through Pennsylvanian (Berg et al., 1980). The age of rocks in the vicinity of Broad Top is Devonian and Mississippian, during which periods several advancements of the sea deposited repeated sequences of sand, gravel, silt, and limy materials. Coal-forming swamps existed in the northwest corner of the county during the Pennsylvanian period. Consolidation of the sediments was followed, during the Permian period, by compression from the southeast that intensely folded and faulted the sediments. The results were valleys and ridges of high relief with a northeast-southwest orientation. Subsequent geologic erosion has caused substantial reduction of the ridges to their size in the present landscape. Quartzite and sandstone, which resist erosion, have remained to form the major ridges. The lower ridges and slopes formed in siltstone and shale, and the valleys formed in limestone (O'Neill, 1964).

In the vicinity of Broad Top, Hazleton, Buchanan, and Dekalb soils are dominant on the cyclic sequences of sandstone, conglomerate, siltstone, and shale of Pennsylvanian age.

Berks, Weikert, and Bedington soils are dominant on the siltstone and shale beds of the Devonian-aged Foreknobs and Scherr formations in the central part of the county. Calvin, Klinesville, and Leck Kill soils are the major soils on the grayish red shale and sandstone of the Devonian-aged Catskill formation mostly in the western and southeastern parts of the county.

Nollville and Wurno soils are dominant on the Silurian- and Devonian-aged calcareous shales. Frankstown and Elliber soils are common on the Devonian-aged Ridgeley Sandstone, Shriver Chert, and limestone in the south-central and northeastern parts of the county.

Hazleton and Dekalb soils predominate on the ridge-forming Tuscarora Orthoquartzite of Silurian age mainly in the western, east-central, and northeastern parts of the county. Laidig, Buchanan, and Sideling soils formed on the colluvial slopes of ridges.

Hagerstown, Murrill, and Clarksburg soils are dominant on the Ordovician carbonates in the gently rolling valleys in the central part of the county.

Mineral Resources

Limestone and coal are mined in the county (Pennsylvania Department of Internal Affairs, Bureau of Statistics, 1944; Kebbish, 1979).

Limestone is mined commercially from the Devonian-aged Keyser and Tonoloway formations and the Silurian-aged Wills Creek formation for use as concrete aggregate and lime. The largest amount of high-calcium rock is in Keyser Limestone, which in some beds is as much as 90 percent $CaCO_3$. Tonoloway Limestone is as much as 80 percent

$CaCO_3$. Reserves from these formations and the Ordovician-aged Bellefonte to Nittany formations have potential for use as agricultural limestone and for dolomite, building stone, crushed rock, and other construction materials.

Gravel material from the weathered Shriver formation and the Ordovician-aged Reedsville formation are used for light-duty local roads and fill. Building stone and construction sand have been obtained from Silurian-aged Tuscarora Orthoquartzite. Clay from the weathered Rose Hill and Reedsville formations have potential use in brick and tile manufacture.

Relatively small amounts of bituminous coal are mined in the Broad Top coal field in the northeast corner of the county. The Allegheny Group of Pennsylvania age has about a dozen coal seams, three of which have commercial mines. The seams had been both deep mined and strip mined, but are now strip mined.

Water Resources

The mean annual precipitation in the county is about 40 inches. The average annual runoff is about 18 inches. Licking Creek, Little Tonoloway Creek, Tonoloway Creek, Cove Creek, Sideling Hill Creek, and Patterson Run flow southward into the Potomac River. Little Aughwick Creek, Sideling Creek, Wooden Bridge Creek, and Brush Creek flow northward into the Susquehanna. These streams have moderate-sized flood plains that are nearly level and lie at or just above the normal flood stages of the streams. The streams have alluvial terraces, which are older flood plains now considerably above the level of streams and rivers. About three-fourths of the water supply for the county comes from ground water sources, and one-fourth comes from surface water supplies. The county uses less than 5 million gallons of water per day.

The major sources of ground water are Cambrian and Ordovician-aged limestone and dolomite aquifers and Devonian and Silurian-aged calcareous shale aquifers (Becher, 1978; Lohran, 1938). Most of these rock formations are in the valleys with extensive ground water use. Most of the ground water sources are developed from shallow or deep wells, and serve both domestic and municipal water supply needs. In most places throughout the county, ground water is 100 to 300 feet below the surface. Springs are common in the carbonate valleys, and some springs are still used for water supplies. Water is nearest the surface in a few places in Big Cove, where it comes to the surface in several places as large springs. Numerous springs issue from shale and sandstone on ridge flanks. Surface streams are common everywhere except over limestone bedrock.

Water quality from ground water sources is generally good. However, hardness is a common problem for sources of water supply on carbonate rocks. Hydrogen sulfide gas may be present in Reedsville Shale. Solution channels, fractures, and partings between rock layers yield moderate or large supplies of water to wells. These features also make the shallow carbonate aquifers subject to contamination from agricultural chemicals, animal wastes, septic systems, landfills, and spills.

Climate

Winters are cold and snowy at higher elevations in Fulton County. The valleys are frequently cold, but intermittent thaws preclude 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 Chambersburg, Pennsylvania, for the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 30 degrees F, and the average daily minimum temperature is 20 degrees. The lowest temperature on record, which occurred on January 17, 1982, is -18 degrees. In summer the average temperature is 72 degrees, and the average daily maximum temperature is 84 degrees.

The highest recorded temperature, which occurred on July 17, 1988, is 106 degrees.

Growing degree days, shown in table 1, 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, 18 inches, or 50 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 23 inches. The heaviest 1-day rainfall during the period of record was 5.08 inches on September 6, 1979. Thunderstorms occur on about 32 days each year, and most occur in summer.

Average seasonal snowfall is 6 inches. The greatest snow depth at any one time during the period of record was 31 inches. On average, 14 days have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 54 percent. Humidity is higher at night, and the average at dawn is about 76 percent. The percentage of possible sunshine is 66 percent in summer and 49 percent in winter. The prevailing wind is from the west northwest. Average windspeed is highest, 10 miles per hour, in spring.

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

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions

are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area may not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent to the soils in the survey areas.

General Soil Map Units

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

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

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

Soil descriptions

1. Berks-Weikert

Gently sloping to very steep, shallow and moderately deep, well drained and somewhat excessively drained soils; on ridges and hillsides in intermountain valleys

These soils formed in materials weathered dominantly from gray, yellowish brown, and olive, acid shale, siltstone, and some residuum derived from sandstone (fig. 2). They are on undulating to rolling ridgetops and hilly to very steep backslopes, mostly in the central part of the county. These areas are dissected by drainageways and small streams, and have U-shaped valleys with narrow flood plains. Most of the map unit is about 950 feet above sea level, but elevations range from 600 feet on the narrow flood plains to 1,200 feet on the highest points in the rolling shale hills.

This map unit makes up about 16 percent of the county. It is about 40 percent Berks soils, 40 percent Weikert soils, and 20 percent minor soils.

Berks soils are gently sloping to moderately steep and are on ridges and hills. These soils are underlain by residuum derived from gray, yellowish brown, and olive, acid shale, siltstone, and some sandstone. They are moderately deep and well drained, and have a medium textured subsoil.

Weikert soils are gently sloping to very steep and are on ridges and hills. These soils are underlain by residuum derived from interbedded gray and brown, acid shale, siltstone, and sandstone or from alternating beds of these materials. They are shallow and somewhat excessively drained and have a medium textured subsoil.

The soils of minor extent in this map unit are Hazleton, Ernest, Brinkerton, Pope, Philo, and Atkins soils. The well drained Hazleton soils are on ridges and hills. The moderately well drained Ernest soils and the poorly drained Brinkerton soils are on toeslopes, bottom lands, and colluvial fans. The well drained Pope soils, the moderately well drained Philo soils, and the poorly drained Atkins soils are on flood plains along streams.

About 70 percent of this map unit is used for cropland, hayland, and pasture. Most steeper areas are used as woodland. Some areas are droughty because of low or moderate available water capacity. Potential productivity for woodland is moderate or moderately high. The main limitations are droughtiness and steep slopes. A few small areas of urban land are scattered throughout. Some recreational areas, such as State game lands, are also in this map unit. Part of the map unit had been farmed, then abandoned and left to grow up in Virginia pine. Almost all crops are grown on gently sloping to rolling uplands and narrow flood plains. The major crops are corn, small grain, and hay. Slope and depth to bedrock are major limitations. Runoff and erosion are major hazards.

The soils of this map unit are well suited to poorly suited to cultivated crops. Berks soils are more productive than the droughtier Weikert soils, but lime and fertilizer are needed on both soils if cultivated crops are grown. Most cultivated areas are in small or low-producing farms, including some commercial dairy farms. This unit is generally well suited to hay and pasture. Depth to bedrock and slope are severe limitations for septic tank absorption fields and urban uses. Some bedrock generally must be excavated to

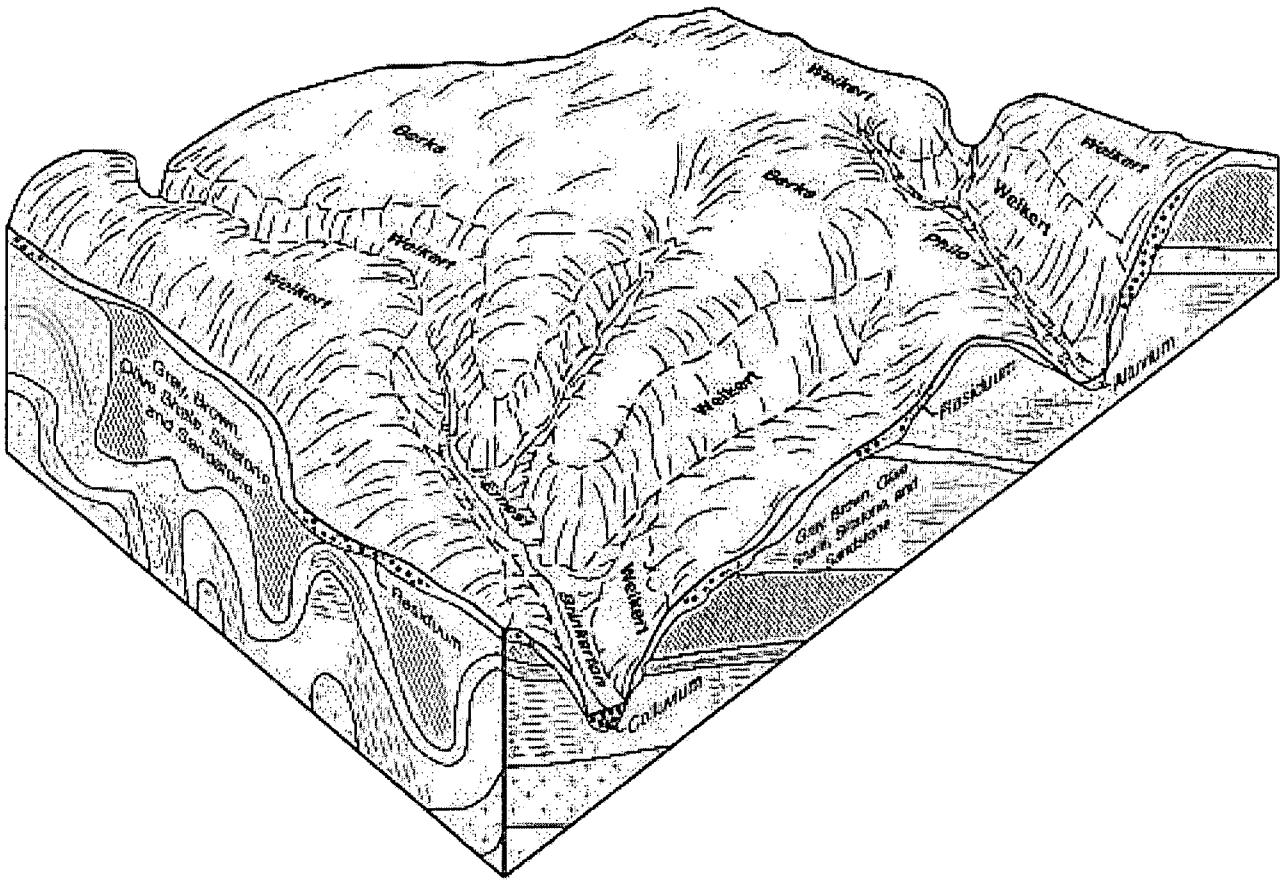

Figure 2.—Relationship of soils to topography and the underlying material in the Berks-Weikert general soil map unit.

build dwellings with basements on this map unit. If a waste disposal system is not properly located or designed, the effluent can seep into cracks in the bedrock and contaminate wells.

2. Calvin-Klinesville

Gently sloping to very steep, shallow and moderately deep, well drained and somewhat excessively drained soils; on ridges and hillsides in intermountain valleys

These soils formed in residuum derived dominantly from acid, red to reddish brown shale, siltstone, and sandstone (fig. 3). They are on undulating to rolling ridgetops and hilly to very steep backslopes, mostly in the western part of the county. These areas are dissected by drainageways and small streams and have U-shaped valleys with narrow flood plains. Most of the map unit is about 1,000 feet above mean sea level (m.s.l.), but the elevation ranges from 600 feet on the narrow flood plains to 1,200 feet above m.s.l. on the highest points in the rolling shale hills.

This map unit makes up about 41 percent of the county. It is about 50 percent Calvin soils, 30 percent Klinesville soils, and 20 percent minor soils.

Calvin soils are gently sloping to very steep and are on ridges and hillsides. These soils are underlain by residuum derived from acid, red to reddish brown shale, siltstone, and sandstone at a depth of 20 to 40 inches. They are moderately deep and well drained and have a medium textured or moderately fine textured subsoil.

Klinesville soils are gently sloping to very steep and are on ridges and hillsides. These soils are underlain by residuum derived from acid, red shale, siltstone, and sandstone at a depth of 20 inches or less. They are shallow and somewhat excessively drained, and have a medium textured subsoil.

The soils of minor extent in this map unit are Leck Kill, Hustontown, Brinkerton, Basher, and Atkins soils. The deep, well drained Leck Kill soils are on ridges and hills. The moderately well drained Hustontown soils and the poorly drained Brinkerton soils are on hillsides, bottom lands, and colluvial fans. The moderately well drained Basher soils and the

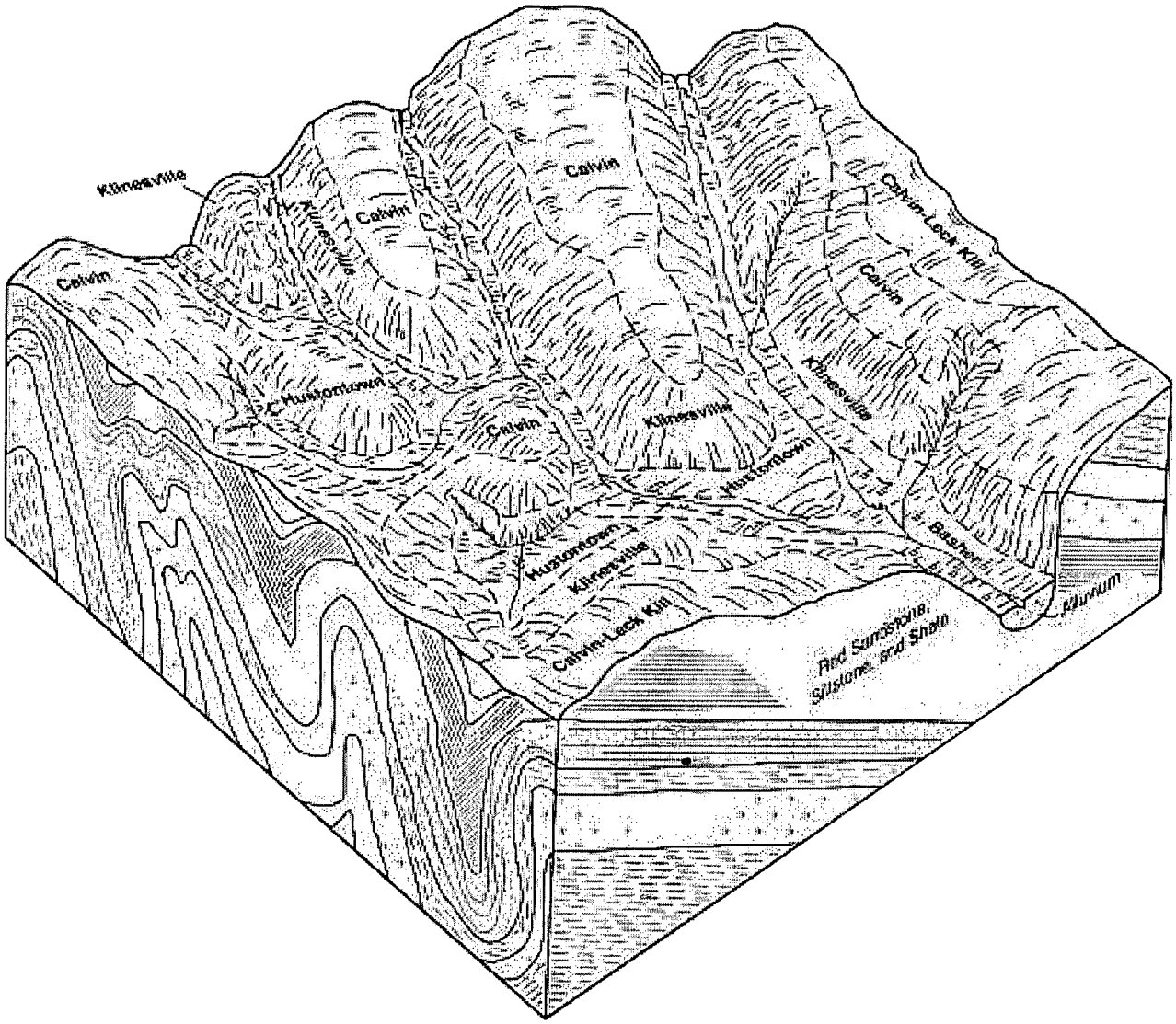

Figure 3.—Relationship of soils to topography and the underlying material in the Calvin-Klinesville general soil map unit.

poorly drained Atkins soils are on flood plains along streams.

About 65 percent of this map unit is used for cropland, hayland, and pasture. Other areas are steeper and are mainly used as woodland. Some areas are generally droughty because of low or moderate available water capacity. Potential productivity for woodland is moderate or moderately high. The main limitations are droughtiness and steep slopes. A few small areas of urban land are scattered throughout. Some recreational areas, such as Meadow Grounds Lake and State game lands, are in this map unit. Some areas of the map unit have been farmed, abandoned, and left to grow up in Virginia pine. Almost all crops are grown on gently sloping to rolling uplands and on narrow flood plains. The major crops are corn, small grain, and hay. The major limitations are slope and depth to bedrock. Runoff and erosion are major hazards.

The soils in this map unit are well suited to poorly suited to cultivated crops. Calvin soils are more productive than the droughtier Klinesville soils, but lime and fertilizer are needed on both soils if cultivated crops are grown. Most cultivated areas are in small or low-producing farms, including some commercial dairy farms. These soils are generally well suited to hay and pasture. Depth to bedrock and slope are severe limitations for septic tank absorption fields and urban uses. Some bedrock generally must be excavated to build dwellings with basements on this map unit. If a

waste disposal system is not properly located or designed, the effluent can seep into cracks in the bedrock and contaminate wells.

3. Hagerstown

Gently sloping to steep, very deep, well drained soils; on intermountain, limestone valley floors

These soils formed in materials weathered dominantly from residuum derived from limestone (fig. 4). They are dominantly on undulating to rolling summits, shoulders, and backslopes. The sinkholes and closed depressions in these soils formed by solution in the underlying limestone. Most areas of the map unit lie in Big Cove, between McConnellsburg and Webster Mills in the eastern part of the county. Small areas are near Warfordsburg and Fort Littleton. Elevation ranges from 600 to 1,200 feet.

This map unit makes up about 3 percent of the county. It is about 60 percent Hagerstown soils and 40 percent soils of minor extent.

Hagerstown soils are gently sloping to steep and are on undulating to rolling summits, shoulders, and backslopes. These soils are underlain by residuum derived from limestone. They are very deep and well drained and have a fine textured subsoil.

The soils of minor extent are Carbo, Murrill, Clarksburg, Penlaw, Lindside, and Melvin soils. The moderately deep Carbo soils are on slight rises and are generally associated with rock outcrop. The well drained Murrill soils have less clay in the upper part of the solum and a lower base saturation than the Hagerstown soils. Murrill soils are on footslopes and backslopes adjacent to the base of sandstone ridges. The colluvial, moderately well drained Clarksburg soils and the somewhat poorly drained Penlaw soils have a fragipan and are generally on the lower toeslopes and in depressions. The moderately well drained Lindside soils and the poorly drained Melvin soils are on flood plains.

Most of this map unit is used for cultivated crops, hayland, and pasture. Some areas are wooded or in urban use. Corn, small grain, and hay are the major crops.

The soils in this map unit are well suited to cultivated crops. The major management concerns are slope and erosion. If fertilized, the soils in this map unit are the most productive and the most desirable for farming in the county. Most farms are commercial dairy farms. The map unit is also well suited to woodland use, and productivity is moderately high.

The unit is moderately suited or poorly suited to waste disposal because of possible ground and surface water contamination. The main limitations are slow permeability, sinkholes, cracks in the bedrock, and slope. The unit is well suited to poorly suited to building site development. The main limitations are depth to bedrock, shrink-swell potential, and slope.

4. Hazleton-Sideling-Dekalb

Gently sloping to very steep, moderately deep and very deep, moderately well drained or well drained soils; on the upper part of mountain slopes and ridges

These soils formed in colluvium and residuum derived from acid, gray, and brown to red sandstone, orthoquartzite, siltstone, and shale (fig. 5). They are on the tops of mountains and ridges and on the upper or middle backslopes of mountains and ridges. Areas of these soils are dominantly very steep, but on mountaintops and ridgetops they are undulating to hilly. These areas are dissected by streams and water gaps. Elevation ranges from 1,400 to 2,400 feet.

This map unit makes up about 23 percent of the county. It is about 32 percent Hazleton soils, 18 percent Sideling soils, 15 percent Dekalb soils, 15 percent Laidig soils, 10 percent Buchanan soils, and 10 percent soils of minor extent.

Hazleton soils are gently sloping to very steep and are on summits, shoulders, and backslopes. These soils are underlain by residuum derived from sandstone or quartzite. They are very deep and well drained and have a coarse or medium textured, skeletal subsoil.

Sideling soils are nearly level to very steep and are on middle and lower backslopes and footslopes. These soils are underlain by colluvium derived from residuum derived from brownish sandstone, siltstone, and shale. They are very deep and moderately well drained and have a medium textured or moderately fine textured subsoil.

Dekalb soils are gently sloping to very steep and are on summits, shoulders, and backslopes. These soils are underlain by residuum derived from sandstone or quartzite. They are moderately deep and well drained and have a coarse textured or medium textured, skeletal subsoil.

Laidig soils are nearly level to very steep and are on middle and lower backslopes and footslopes. These soils are underlain by colluvial deposits weathered from residuum derived from brownish sandstone, siltstone, and shale. They are very deep and well drained and have a medium textured or moderately fine textured subsoil and fragipan.

Buchanan soils are nearly level to moderately steep and are on benches, middle to lower backslopes, and footslopes. These soils are underlain by colluvial deposits derived from residuum derived from acid sandstone, siltstone, and shale. They are very deep and moderately well drained and have a medium

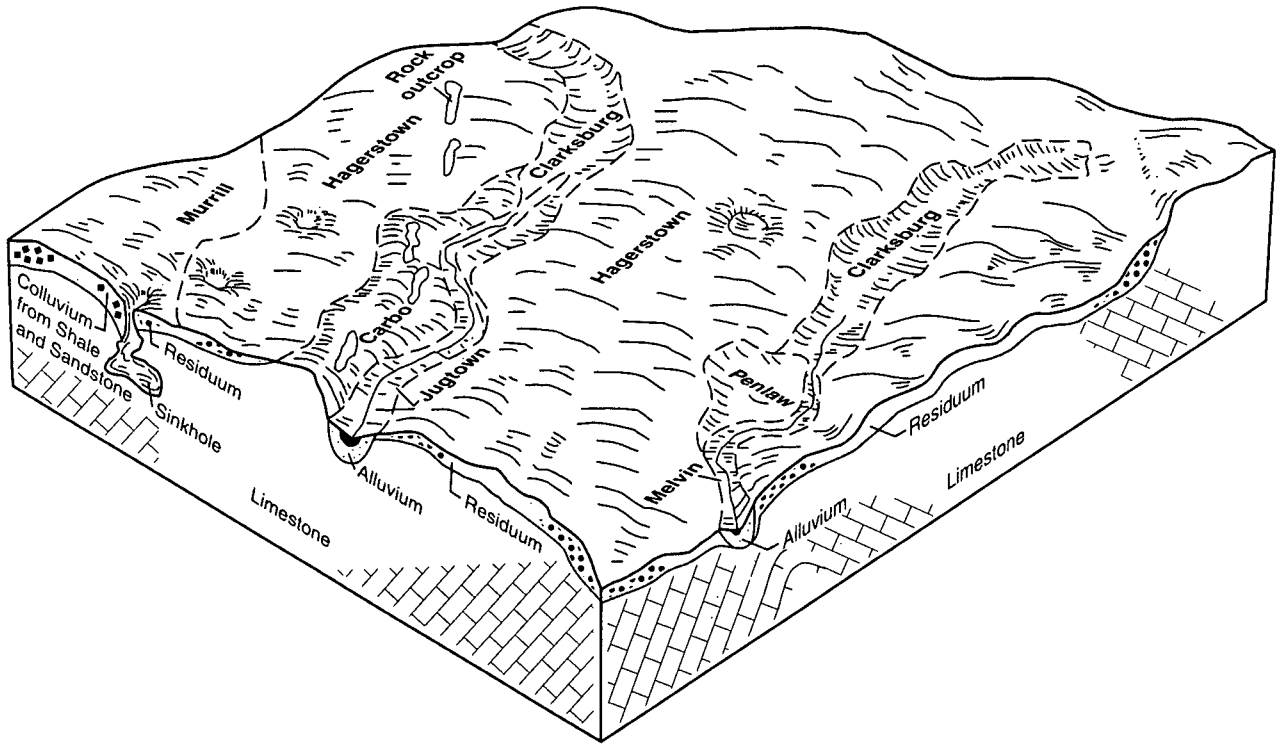

Figure 4.—Relationship of soils to topography and the underlying material in the Hagerstown general soil map unit.

textured or moderately fine textured subsoil and fragipan.

The soils of minor extent in this map unit are Andover, Cedarcreek, Weikert, and Philo soils. The poorly drained Andover soils are dominantly gray and are on toeslopes. Cedarcreek soils are in some strip-mined areas in the northwesternmost part of the county. Also included are a few scattered areas of residual Weikert soils. Philo soils are on flood plains.

Most areas of this map unit are used as woodland. A few small areas are farmed or in nonfarm uses. Many areas are used for hunting, camping, and other recreation uses. The major crops are timber and pulpwood.

The soils in this map unit are too steep or stony to be used for cultivated crops and pasture, and are generally unsuitable for these uses. They are well suited to woodland use, recreation, and wildlife habitat. Potential productivity for woodland is moderate or moderately high. Large areas of State forest land and State game lands are in this map unit. The soils are generally unsuitable for most kinds of waste disposal systems and urban uses because of slope, stoniness, depth to bedrock, the seasonal high water table, and slow permeability. In many areas these limitations are difficult to overcome.

5. Laidig-Buchanan

Gently sloping to very steep, very deep, moderately well drained or well drained soils; on the middle and lower parts of mountain slopes and ridges

These soils formed in materials weathered dominantly from colluvial deposits of residuum derived from sandstone, siltstone, and shale (fig. 6). They are on colluvial mountain slopes, ridges, benches, and fans. Areas of these soils range from undulating on toeslopes and foot slopes to very steep on backslopes. Most areas of the soils are very stony or extremely stony. The areas are dissected by streams. Elevation ranges from 700 to 1,600 feet.

This map unit makes up about 11 percent of the county. It is about 65 percent Laidig soils, 20 percent Buchanan soils, and 15 percent minor soils.

Laidig soils are nearly level to very steep and are on middle and lower backslopes and footslopes. These soils are underlain by colluvial deposits weathered from residuum derived from brownish sandstone, siltstone, and shale. They are very deep and well drained and have a medium textured or moderately fine textured subsoil and fragipan.

Buchanan soils are nearly level to moderately steep and are on lower backslopes, footslopes, toeslopes,

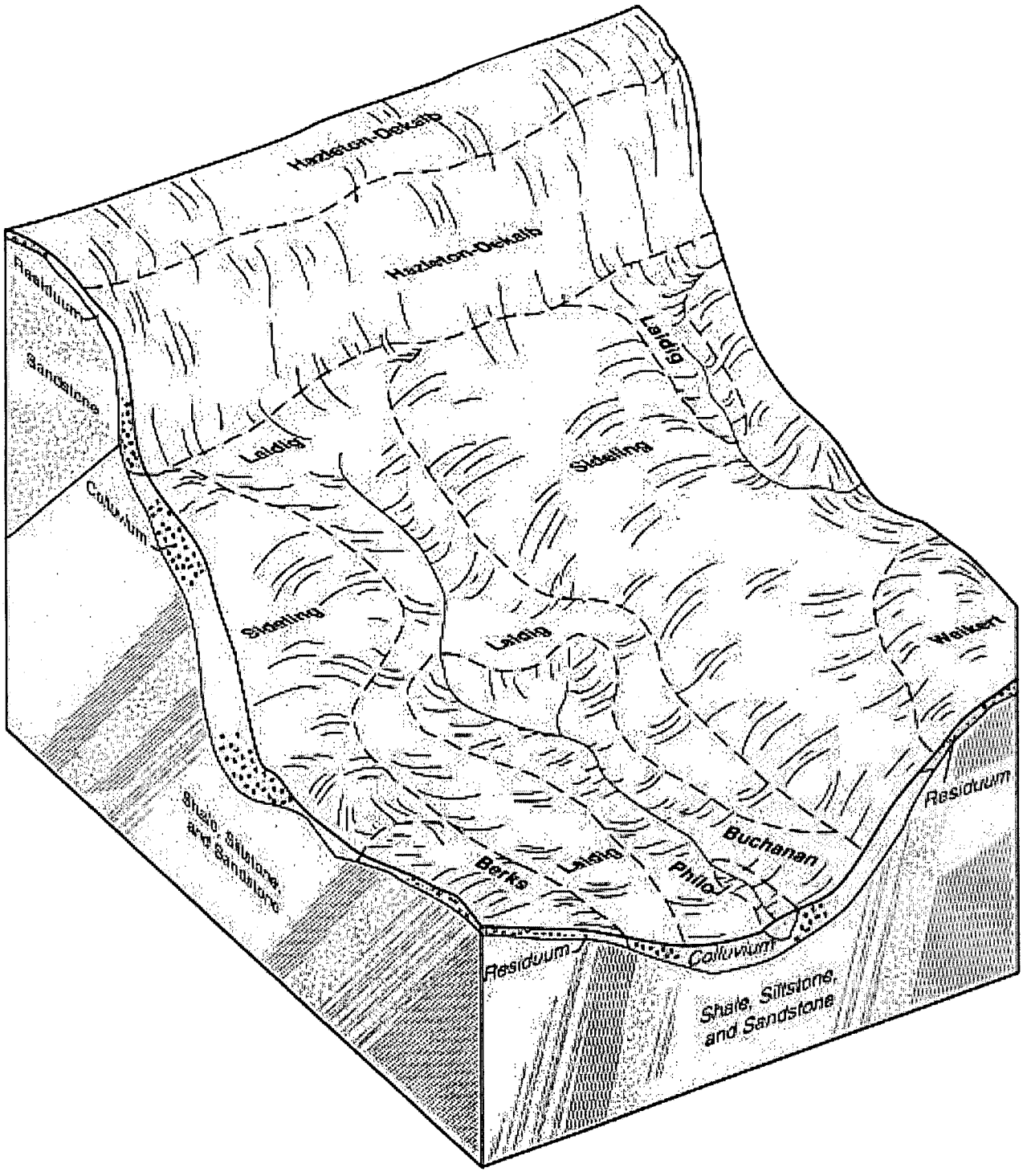

Figure 5.—Relationship of soils to topography and the underlying material in the Hazleton-Sideling-Dekalb general soil map unit.

benches, and fans. These soils are underlain by colluvium weathered from residuum derived from acid sandstone, siltstone, and shale. They are very deep and moderately well drained and have a medium textured or moderately fine textured subsoil and fragipan.

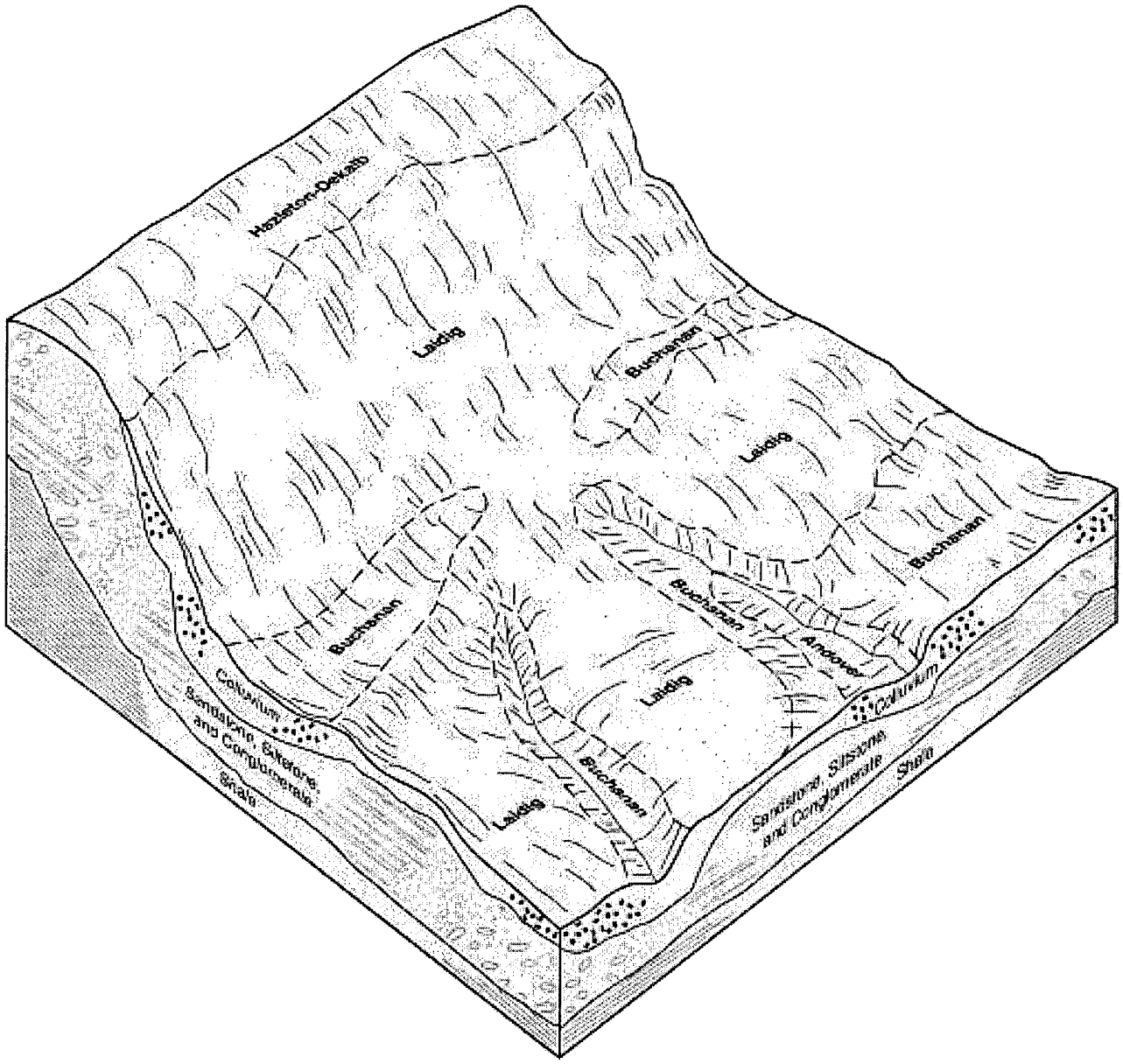

Figure 6.—Relationship of soils to topography and the underlying material in the Laidig-Buchanan general soil map unit.

The soils of minor extent in this map unit are Andover, Dekalb, Hazleton, and Murrill soils. The poorly drained Andover soils are dominantly gray, have a fragipan, and are on benches and toeslopes. The well drained Dekalb and Hazleton soils are skeletal, do not have a fragipan, and are on higher ridgetops and backslopes. The well drained Murrill soils do not have a fragipan, contain more clay in the lower part of the solum, and are on lower backslopes and foot slopes overlying limestone bedrock.

Most areas of this map unit are used for woodland. About 10 percent of the map unit is cleared and is used for hayland and cropland but mostly for pasture.

The soils of this map unit are poorly suited to most cultivated crops because of slope and large stones and boulders. It is well suited to woodland use. Slope, large stones, slow permeability, and the seasonal high water table are limitations for most community development. The soils have potential for development of wildlife habitat and recreation areas. Large areas of State game lands and State forestland are in this map unit.

6. Murrill-Clarksburg

Gently sloping to moderately steep, very deep, well drained and moderately well drained soils; on lower mountain slopes and limestone valley floors

These soils formed in materials weathered dominantly from colluvial sandstone, siltstone, and shale material that was moved downslope by erosion, gravitational creep, and frost action and that was deposited over residuum derived from limestone. They are on undulating to rolling colluvial fans, toeslopes, and footslopes. Karst topography with a few large and some small, closed depressions or sinkholes are in some areas. This map unit is in Big Cove. It surrounds and lies slightly higher than the Hagerstown general soil map unit. Elevation ranges from 600 feet on flood plains to about 1,200 feet on hilltops, but is mostly around 900 feet.

This map unit makes up about 3 percent of the county. It is about 30 percent Murrill soils, 25 percent Clarksburg soils, and 45 percent soils of minor extent.

Murrill soils are gently sloping to moderately steep and are on fans, footslopes, and backslopes. These soils lie slightly higher on the landscape than the moderately well drained Clarksburg soils. They are underlain by colluvium weathered from residuum derived from limestone, calcareous and noncalcareous shale, and sandstone. They are very deep and well drained and have a medium textured to fine textured subsoil.

Clarksburg soils are gently sloping and are on fans, footslopes, and toeslopes. These soils are underlain by colluvium weathered from residuum derived from limestone, calcareous and noncalcareous shale, and sandstone. They are very deep and moderately well drained and have a medium textured or moderately fine textured subsoil and fragipan.

The soils of minor extent in this map unit are Penlaw, Laidig, Buchanan, Hagerstown, Frankstown, Lindside, and Melvin soils. The somewhat poorly drained Penlaw soils have a fragipan and are generally on slightly lower toeslopes and in depressions. Colluvial, well drained Laidig soils and moderately well drained Buchanan soils have a fragipan and are generally on higher foot slopes and backslopes near the major sandstone ridges. Hagerstown soils are residual and well drained. Compared to the other soils of minor extent, they have more clay throughout the solum and are on higher backslopes and ridgetops generally further into the limestone valley from the major sandstone ridges. Frankstown soils are very deep and well drained. They have more chert fragments than the other soils and are generally on slightly higher backslopes and ridgetops. Moderately well drained Lindside soils and poorly drained Melvin soils do not have a fragipan and are on nearby flood plains.

About 65 percent of this map unit is used for cropland, hayland, and pasture. The rest is mainly in woodland use. A few areas are in urban use. The major crops are corn, hay, and small grain.

The soils of this map unit are generally well suited to cultivated crops, hay, and pasture. The water holding capacity is moderate or high. On Clarksburg and Penlaw soils the seasonal high water table can interfere with timely tillage and field operations. Most of the farms are commercial dairy farms. In many areas the high gravel content of the soils could hinder tillage and planting equipment. Some areas have large surface stones and steeper slopes, and are not suited to farming. This unit is well suited to trees. Potential productivity for woodland is moderate or moderately high.

The unit is fairly well suited to poorly suited to waste disposal systems because of slope, the hazard of ground water contamination, wetness, and slow permeability. The unit is well suited to poorly suited to home sites. Wetness and slope are serious limitations.

7. Wurno-Nollville

Gently sloping to steep, moderately deep and deep, well drained soils; on hills and ridges in intermountain valleys

These soils formed in materials weathered dominantly from residuum and colluvium derived from siliceous and cherty limestone interbedded with calcareous shale and sandstone. They are on undulating foot slopes and undulating to rolling ridgetops that have steep backslopes. The ridges are elongated and are dissected in places by drainageways. The largest area of this map unit is in the Pigeon Cove area. A smaller area of the map unit is on the ridge west of Fort Littleton. Elevation is about 1,000 to 1,400 feet.

This map unit makes up about 3 percent of the county. It is about 30 percent Wurno soils, 10 percent Nollville soils, 10 percent Frankstown soils, 10 percent Elliber soils, and 40 percent minor soils.

Wurno soils are gently sloping to steep and are on ridgetops and backslopes. These soils are underlain by residuum weathered from calcareous shale and limestone. They are moderately deep, well drained, and medium textured.

Nollville soils are gently sloping to steep and generally are on backslopes. These soils are underlain by residuum weathered from calcareous shale and

interbedded limestone. They are deep and well drained and have a medium textured or moderately fine textured subsoil.

Frankstown soils are gently sloping to very steep and are on ridgetops, backslopes, and footslopes. These soils are underlain by residuum and colluvium weathered from siliceous and cherty limestone interbedded with calcareous shale and sandstone. They are very deep and well drained and have a medium textured or moderately fine textured subsoil.

Elliber soils are gently sloping to moderately steep. They are underlain by residuum weathered from very cherty limestone. They are very deep and well drained and have a moderately fine textured or medium textured subsoil.

The soils of minor extent in this map unit are Pecktonville, Dekalb, Hazleton, Murrill, and Clarksburg soils. The well drained Pecktonville soils have more clay in the solum and are on adjacent, slightly lower backslopes than the other soils of minor extent. Dekalb and Hazleton soils are loamy-skeletal and well drained. They do not have an argillic horizon and are on the steeper backslopes and on some ridgetops. Murrill soils are colluvial and well drained, have a thicker solum and dominantly sandstone rock fragments, and are in swales and on footslopes. Clarksburg soils are moderately well drained and are in depressions and drainageways.

Much of the ridgetops and steeper backslopes of this map unit are used as woodland. The soils are well suited to woodland, and potential productivity is moderately high. The less steeply sloping backslopes and footslopes and some areas on ridgetops are used for hayland, pasture, and cropland. The major crops are corn, small grain, and hay.

The soils of this map unit are well suited to poorly suited to cultivated crops. The main limitations are the steep slopes, the erosion hazard, and small surface stones.

Depth to bedrock, permeability, and slope are moderate or severe limitations to septic tank absorption fields and urban uses. The effluent from waste disposal systems could flow through channels in the underlying limestone and contaminate the ground water. Some bedrock may need to be excavated if dwellings with basements are built on these soils. Some small areas of this unit are mined for use as fill material for roads.

Detailed Soil Map Units

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

General and detailed information about managing a map unit is given under the heading "Use and Management of the Soils," including the sections "Crops and Pasture," "Forestland Management and Productivity," "Recreation," "Wildlife Habitat," and "Engineering."

Horizon depths and textures, soil properties, and other information specific to each map unit is given in the "Soil Properties" section.

A description of a typical map unit, including the range in characteristics, is given in the "Classification of the Soils" section.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some dissimilar inclusions that belong to taxonomic classes other than those of the major soils.

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

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Allegheny loam, 3 to 8 percent slopes, is a phase of the Allegheny series.

Some map units are made up of two or more major

soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Andover-Buchanan complex, 3 to 8 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas 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 or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Hazleton and Dekalb soils, 0 to 8 percent slopes, extremely stony, is an undifferentiated group in this survey area.

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

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

Soil descriptions

AgB—Allegheny loam, 3 to 8 percent slopes

Typical Composition

Allegheny and similar soils: 85 percent
Dissimilar inclusions: Monongahela—8 percent; Tyler—3 percent; moderately well drained, moderately deep soils—2 percent; Hustontown—1 percent; Philo—1 percent

Setting

Landform: Terraces
Slope: 3 to 8 percent
The Allegheny soil is about 15 to 80 feet above the present flood plain. Short escarpments are generally at the boundary of adjacent flood plains.

Soil Properties and Qualities

Texture of the surface layer: Loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Old alluvium washed from uplands underlain by acid shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 8.9 inches

Inclusions

Dissimilar inclusions:
- Monongahela and Tyler soils, which are on terraces slightly lower than those of the Allegheny soil
- Moderately well drained, moderately deep soils on concave to plane backslopes
- Small areas of Hustontown soils on toeslopes and in swales
- A few narrow strips of Philo soils on flood plains

Similar inclusions:
- A few small areas of soils that have more clay than the Allegheny soil
- Some areas of soils that are redder than the Allegheny soil or that have more than 35 percent cobbles and gravel
- A few areas of soils that have a loam or sandy loam surface layer

AnB—Andover gravelly loam, 3 to 8 percent slopes

Typical Composition

Andover and similar soils: 75 percent
Dissimilar inclusions: Buchanan—15 percent; Atkins—3 percent; Philo—2 percent; swampy areas—3 percent; Sideling—2 percent

Setting

Landform: Base of mountain slopes
Position on landform: Depressions, benches, swales, and concave toeslopes and footslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (0 to 0.5 feet)
Available water capacity: Mainly 5.7 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils, which are slightly higher on toeslopes than the Andover soil
- Areas of Atkins and Philo soils, which are adjacent

to streams that dissect the map unit and which are subject to frequent flooding of very brief duration
• Well drained Sideling soils, which are on convex footslopes along the edges of some map units
Similar inclusions:
• A few areas of soils that have more sand in the surface layer than the Andover soil
• Some areas of soils that are not firm and brittle in the lower part of the subsoil like the Andover soil
• Some small areas of soils that have up to 50 percent cobbles and gravel throughout
• A few areas of soils that are redder than the Andover soil

AoB—Andover gravelly loam, 0 to 8 percent slopes, very stony

Typical Composition

Andover and similar soils: 70 percent
Dissimilar inclusions: Buchanan—15 percent; Atkins—6 percent; Philo—4 percent; swampy areas—3 percent; Sideling—2 percent

Setting

Landform: Base of mountain slopes
Position on landform: Depressions, drainageways, benches, and toeslopes
Slope: 0 to 3 percent
Large stones and some boulders cover 0.1 to 3 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (0 to 0.5 foot)
Available water capacity: Mainly 5.6 inches

Inclusions

Dissimilar inclusions:
• Buchanan soils, which are slightly higher on toeslopes than the Andover soil
• Atkins and Philo soils, which are adjacent to streams that dissect the map unit and which are subject to frequent flooding of very brief duration
• Sideling soils, which are well drained and on convex footslopes
Similar inclusions:
• A few areas of soils that have more sand in the surface layer than the Andover soil
• Some areas of soils that are unlike the Andover soil, which is firm and brittle in the lower part of the subsoil
• Some small areas of soils that have up to 60 percent cobbles and stones throughout
• A few areas of soils that are redder than the Andover soil

As—Atkins silt loam

Typical Composition

Atkins and similar soils: 85 percent
Dissimilar inclusions: Ernest—5 percent; Brinkerton—3 percent; Tyler—5 percent; Pope—2 percent

Setting

Landform: Nearly level to slightly concave flood plains (fig. 7)
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Stratified alluvium washed from uplands underlain by acid shale, siltstone, and sandstone
Flooding: Frequent
Water table: Apparent (0 to 0.5 feet)
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
• Ernest and Brinkerton on toeslopes
• Tyler soils, which are on small terraces generally separated from Atkins soils by short escarpments and which are either subject to rare flooding or never subject to flooding
• In drainageways near major ridges some areas of soils that have a stony to extremely stony surface layer
• Some areas of soils that are better drained than the Atkins soil
Similar inclusions:
• A few areas of soils that have a very sandy or very gravelly surface layer
• Some areas of soils where the surface layer is dark and 5 to 25 inches thick
• A few areas of soils that have a clayey subsoil and substratum
• Some areas of soils that are redder than the Atkins soil

Figure 7.—Atkins silt loam in a narrow drainageway. The Atkins soil is adjacent to Ernest, Berks, and Brinkerton soils.

Be—Barbour fine sandy loam

Typical Composition

Barbour and similar soils: 85 percent
Dissimilar inclusions: Hustontown—5 percent; Brinkerton—3 percent; Atkins—5 percent; soils that are subject to ponding—2 percent

Setting

Landform: Flood plains
Slope: 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium washed from uplands underlain by acid, reddish sandstone, siltstone, and shale
Flooding: Frequent
Water table: Apparent (3.0 to 6.0 feet)
Available water capacity: Mainly 6.4 inches

Inclusions

Dissimilar inclusions:
- Hustontown and Brinkerton soils on toeslopes and fans
- Atkins soils in slightly lower areas than the Barbour soil

Similar inclusions:
- Scattered areas of well drained soils on low terraces that are in slightly higher positions than the Barbour soil
- A few areas of soils that are sandy loam or finer in the lower horizons
- Some areas of soils that are slightly acid or neutral
- Some small areas of moderately well drained soils
- A few areas of soils that have bedrock at a depth of 30 to 60 inches
- Some small areas of soils that have gravelly or very gravelly upper layers

Bf—Basher fine sandy loam

Typical Composition

Basher and similar soils: 85 percent
Dissimilar inclusions: Hustontown—5 percent; very stony areas—1 percent; Brinkerton—3 percent; Atkins—4 percent; very poorly drained soils—2 percent

Setting

Landform: Flood plains
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Alluvium washed from uplands underlain by red shale, siltstone, and sandstone
Flooding: Occasional
Water table: Apparent (1.5 to 2.0 feet)
Available water capacity: Mainly 7.6 inches

Inclusions

Dissimilar inclusions:
- In some narrow map units Hustontown and Brinkerton soils on toeslopes and fans
- Atkins soils in slightly lower areas than the Basher soil
- Very poorly drained soils in depressions and slackwater areas
- Some small, closed depressions that are subject to frequent ponding
- Some very stony areas of soils in drainageways near major ridges

Similar inclusions:
- Scattered areas of well drained soils on low terraces that are in slightly higher positions than the Basher soil
- A few areas of soils that have sand and gravel above a depth of 40 inches
- Some areas of soils that are slightly acid or neutral throughout
- Small areas of soils that are on slightly higher rises and are better drained than the Basher soil
- Some areas of yellowish brown and brown soils

BhB—Bedington channery silt loam, 3 to 8 percent slopes

Typical Composition

Bedington and similar soils: 90 percent
Dissimilar inclusions: Weikert—5 percent; Ernest—3 percent; moderately well drained and moderately deep soils—2 percent

Setting

Landform: Hills
Position on landform: Summits
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 7.4 inches

Inclusions

Dissimilar inclusions:
- Weikert soils on more convex ridgetops and backslopes
- Ernest soils on toeslopes and footslopes
- Moderately well drained, moderately deep soils on concave backslopes and saddles on ridgetops

Similar inclusions:
- A few areas of soils that have fractured shale at a depth of 40 to 60 inches
- A few areas of soils that have more sand in the surface and subsoil
- Some areas of soils that are slightly acid or neutral

BhC—Bedington channery silt loam, 8 to 15 percent slopes

Typical Composition

Bedington and similar soils: 85 percent
Dissimilar inclusions: Weikert—8 percent; Ernest—4 percent; moderately well drained, moderately deep soils—3 percent

Setting

Landform: Hills
Position on landform: Backslopes and shoulders
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Gray, yellowish-brown, and olive acid

shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 7.6 inches

Inclusions

Dissimilar inclusions:
- Weikert soils on the more convex ridgetops and nose slopes
- Ernest soils on toeslopes and footslopes
- Moderately well drained, moderately deep soils on concave backslopes and saddles on ridgetops

Similar inclusions:
- A few areas of soils that have fractured shale at a depth of 20 to 60 inches
- A few areas of soils that have more sand in the surface layer and subsoil
- Some areas of soils that are slightly acid or neutral

BhD—Bedington channery silt loam, 15 to 25 percent slopes

Typical Composition

Bedington and similar soils: 85 percent
Dissimilar inclusions: Moderately well drained, moderately deep soils—8 percent; Ernest—4 percent; Weikert—3 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 7.6 inches

Inclusions

Dissimilar inclusions:
- Weikert soils, which are on the steeper backslopes and which generally are in the more convex positions than the Bedington soil
- Ernest soils on toeslopes and footslopes
- Moderately well drained, moderately deep soils on concave backslopes
- A few areas of soils that have a stony or very stony surface layer
- Rock outcrops in places on narrow ridgetops, on backslopes, and in other convex positions
- Small, wet weather springs and seeps

Similar inclusions:
- A few areas of soils that have fractured shale bedrock at a depth of 20 to 60 inches
- Some small areas of soils that are sandier throughout than the Bedington soil
- A few areas of soils that are slightly acid or neutral

BkB—Berks channery silt loam, 3 to 8 percent slopes

Setting

Landform: Hills
Position on landform: Summits
Slope: 3 to 8 percent

Typical Composition

Berks and similar soils: 85 percent
Dissimilar inclusions: Weikert—5 percent; Ernest—5 percent; moderately well drained, moderately deep soils—5 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 2.8 inches

Inclusions

Dissimilar inclusions:
- Weikert soils on the more convex ridgetops and knolls
- Moderately well drained, moderately deep or deep soils on concave backslopes and on saddles on ridgetops
- Ernest soils on toeslopes, on footslopes, and in swales

Similar inclusions:
- Some small areas of soils that are more than 40 inches deep to bedrock
- A few areas of soils that have a higher clay content than the Berks soil

• Some areas of soils that are redder than the Berks soil and that generally are in alternating bands with yellowish brown soils
• A few areas of soils that have a sandy surface layer and subsoil
• Some areas of soils that are slightly acid or neutral

BkC—Berks channery silt loam, 8 to 15 percent slopes

Typical Composition

Berks and similar soils: 85 percent
Dissimilar inclusions: Weikert—8 percent; Ernest—4 percent; moderately well drained, moderately deep soils—3 percent

Setting

Landform: Hills
Position on landform: Shoulders and backslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 2.8 inches

Inclusions

Dissimilar inclusions:
• Weikert soils are on convex ridgetops and nose slopes
• Ernest soils are on toeslopes, on footslopes, and in swales
• Moderately well drained, moderately deep or deep soils on concave backslopes, in swales, and on saddles on ridgetops
• Very narrow areas of alluvial soils along drainageways
• A few areas that have small, wet weather springs and seeps
Similar inclusions:
• Some small areas of soils that are more than 40 inches deep to bedrock
• A few areas of soils that have a higher clay content than the Berks soil
• Some areas of soils that are redder than the Berks soil and that are generally in alternating bands with yellowish brown soils
• A few areas of soils that have a sandy surface layer and subsoil
• Some areas of soils that are slightly acid or neutral

BkD—Berks channery silt loam, 15 to 25 percent slopes

Typical Composition

Berks and similar soils: 85 percent
Dissimilar inclusions: Weikert—5 percent; Ernest—4 percent; moderately well drained, moderately deep soils—4 percent; Atkins—2 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Flooding: None
Available water capacity: Mainly 2.7 inches

Inclusions

Dissimilar inclusions:
• Shallow Weikert soils, which are on the more convex parts of backslopes
• Ernest soils are on toeslopes, on footslopes, and in swales
• Moderately well drained, moderately deep or deep soils on head slopes and on concave backslopes
• Very narrow areas of alluvial soils along drainageways
Similar inclusions:
• Some small areas of soils that are more than 40 inches deep to bedrock
• A few areas of soils that have a higher clay content than the Berks soil
• Some areas of soils that are redder than the Berks soil and that are generally in alternating bands with yellowish brown soils
• A few areas of soils that have a sandy surface layer and subsoil derived from sandstone
• Some areas of soils that are slightly acid or neutral

BrA—Brinkerton silt loam, 0 to 3 percent slopes

Typical Composition

Brinkerton and similar soils: 80 percent
Dissimilar inclusions: Atkins—6 percent; Philo—5; percent; Laidig—5 percent; Berks—4 percent

Setting

Landform: Base of hills and benches of ridges
Position on landform: In depressions, along drainageways, and on toeslopes
Slope: 0 to 3 percent
The Brinkerton soil is on concave parts of toeslopes and in depressions.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Colluvium derived from acid shale, siltstone, and sandstone
Flooding: None
Water table: Perched (0 to 0.5 feet)
Available water capacity: Mainly 8.4 inches

Inclusions

Dissimilar inclusions:
- Atkins and Philo soils, which are on flood plains adjacent to streams and drainageways, which generally are long and narrow, and which are subject to frequent flooding of very brief duration
- Laidig and Berks soils, which are on backslopes at slightly higher elevations than the Brinkerton soil

Similar inclusions:
- Some small areas of moderately well drained, moderately deep soils on concave backslopes and footslopes
- Some small areas of moderately well drained and somewhat poorly drained soils on small terraces
- A few areas of soils that have a subsoil of silty clay or clay, that are not firm and brittle in the lower layer, and that are subject to frequent ponding for short periods
- Some areas of soils that are sandier and redder than the Brinkerton soil

BrB—Brinkerton silt loam, 3 to 8 percent slopes

Typical Composition

Brinkerton and similar soils: 75 percent
Dissimilar inclusions: Ernest—10 percent; Atkins—3 percent; Philo—2 percent; Laidig—5 percent; Berks—5 percent

Setting

Landform: Base of hills and benches of ridges
Position on landform: In depressions, along drainageways, and on toeslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Colluvium derived from acid shale, siltstone, and sandstone
Flooding: None
Water table: Perched (0 to 0.5 feet)
Available water capacity: Mainly 8.4 inches

Inclusions

Dissimilar inclusions:
- Ernest soils on the slightly higher parts of toeslopes
- Atkins and Philo soils that are on flood plains adjacent to streams and drainageways, that are generally long and narrow, and that are subject to frequent flooding of very brief duration
- Laidig and Berks soils on backslopes at slightly higher elevations than the Brinkerton soil

Similar inclusions:
- A few areas of soils that are silty clay to clay in the subsoil
- Soils that are subject to ponding for short durations, especially in early spring and during other wet periods
- Some areas of soils that are sandier and redder than the Brinkerton soil

BuB—Buchanan gravelly loam, 3 to 8 percent slopes

Typical Composition

Buchanan and similar soils: 85 percent
Dissimilar inclusions: Andover—5 percent; alluvial soils—3 percent; Berks—3 percent; Bedington—3 percent; springs and seeps—1 percent

Setting

Landform: Base of mountain slopes and benches
Position on landform: Toeslopes and along drainageways
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 6.6 inches

Inclusions

Dissimilar inclusions:
- Andover soils in depressions and swales
- Well drained to poorly drained, alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration
- Berks and Bedington soils, which are in the more convex positions than those of the Buchanan soil

Similar inclusions:
- Some areas of soils that have a sandy loam surface layer
- A few areas of soils that are reddish brown throughout the subsoil or that are clayey below a depth of 40 inches
- Some areas of soils that are not firm and brittle in the lower part of the subsoil
- A few areas of soils that are slightly acid or neutral

BuC—Buchanan gravelly loam, 8 to 15 percent slopes

Typical Composition

Buchanan and similar soils: 85 percent
Dissimilar inclusions: Andover—5 percent; alluvial soils—3 percent; Berks—3 percent; Bedington—3 percent; springs and seeps—1 percent

Setting

Landform: Mountain slopes and benches
Position on landform: Footslopes and along drainageways
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 6.0 inches

Inclusions

Dissimilar inclusions:
- Andover soils in depressions and swales
- Berks and Bedington soils, which are in more convex positions than those of the Buchanan soil
- Well drained to poorly drained alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- Some areas of soils that are reddish brown throughout the subsoil or that are clayey below a depth of 40 inches
- A few areas of soils that have a surface layer of sandy loam
- Some areas of soils that are not firm and brittle in the lower part of the subsoil
- A few areas of soils that are slightly acid or neutral

BxB—Buchanan cobbly loam, 0 to 8 percent slopes, extremely stony

Typical Composition

Buchanan and similar soils: 90 percent
Dissimilar inclusions: Andover—5 percent; alluvial soils—3 percent; Berks—2 percent

Setting

Landform: Base of mountain slopes and benches
Position on landform: Toeslopes and along drainageways
Slope: 0 to 8 percent
Large stones and boulders cover 3 to 15 percent of the surface. In some areas seeps and springs are common.

Soil Properties and Qualities

Texture of the surface layer: Cobbly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 6.3 inches

Inclusions

Dissimilar inclusions:
- Andover soils, which are on the nearly level toeslopes, in depressions, or in swales
- Well drained to poorly drained, alluvial soils that

are in narrow areas along streams and drainageways and that are subject to occasional flooding of brief duration
• Berks soils, which are on backslopes more convex than those of the Buchanan soil
Similar inclusions:
• Well drained, colluvial soils on slightly higher, more convex footslopes than those of the Buchanan soil
• A few areas of soils that have a sandy loam surface layer
• A few areas of soils that are reddish brown throughout the subsoil or that are clayey below a depth of 40 inches
• Some areas of soils that are not firm and brittle in the lower part of the subsoil

BxD—Buchanan cobbly loam, 8 to 25 percent slopes, extremely stony

Typical Composition

Buchanan and similar soils: 85 percent
Dissimilar inclusions: Andover—3 percent; alluvial soils—2 percent; Berks—2 percent; Bedington—2 percent; Hazleton—5 percent; springs and seeps—1 percent

Setting

Landform: Mountain slopes and benches
Position on landform: Footslopes
Slope: 8 to 25 percent
Large stones and boulders cover 3 to 15 percent of the surface. In some areas seeps and springs are common.

Soil Properties and Qualities

Texture of the surface layer: Cobbly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 6.3 inches

Inclusions

Dissimilar inclusions:
• Poorly drained Andover soils in depressions and swales
• Berks and Hazleton soils on the more convex backslopes
• Well drained to poorly drained alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration
Similar inclusions:
• Some small areas of well drained soils
• A few areas of soils that have a surface layer of sandy loam
• Some small areas of soils that have a reddish brown surface layer
• Some areas of soils that are not firm and brittle in the lower part of the subsoil

CaB—Calvin channery loam, 3 to 8 percent slopes

Typical Composition

Calvin and similar soils: 85 percent
Dissimilar inclusions: Klinesville—9 percent; moderately well drained, moderately deep soils—3 percent; Hustontown—2 percent; Basher—1 percent

Setting

Landform: Hills
Position on landform: Summits (fig. 8)
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Channery loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, red to reddish brown shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 4.1 inches

Inclusions

Dissimilar inclusions:
• Shallow Klinesville soils on the more convex ridgetops and the steeper backslopes
• Some areas of fractured rock outcrop
• Moderately deep, somewhat poorly drained to moderately well drained soils at the heads of drainageways and on saddles
• Hustontown soils on concave backslopes and in swales
• Very narrow areas of Basher soils along drainageways
Similar inclusions:
• Some small areas of soils that have a loamy sand surface layer
• Some small areas of soils that are deep to bedrock
• A few areas of soils that have a clay subsoil
• Some areas of soils that are yellowish brown and that generally are in alternating bands with reddish soils

Figure 8.—Crops and hay on Calvin channery loam, 3 to 8 percent slopes. Klinesville soils are in the steeper, wooded areas.

- Areas of slightly acid or neutral soils

CaC—Calvin channery loam, 8 to 15 percent slopes

Typical Composition

Calvin and similar soils: 85 percent
Dissimilar inclusions: Klinesville—10 percent; moderately well drained, moderately deep soils—2 percent; Hustontown—2 percent; Basher—1 percent

Setting

Landform: Hills
Position on landform: Backslopes and shoulders
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, red to reddish brown shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 4.1 inches

Inclusions

Dissimilar inclusions:
- Shallow Klinesville soils on convex ridgetops and nose slopes
- Some areas of fractured rock outcrop
- Moderately deep, somewhat poorly drained or moderately well drained soils at the heads of drainageways and on saddles and footslopes
- Hustontown soils on toeslopes and footslopes
- A few wooded areas where the soils have a stony or very stony surface layer
- Small, wet weather springs and seeps

Similar inclusions:
- Some small areas of soils that have a loamy sand surface layer
- Some small areas of soils that are deep to bedrock
- Some areas of soils that have more clay in the subsoil than the Calvin soil
- A few areas of soils that are yellowish brown and that generally are in alternating bands with reddish soils
- Some areas of slightly acid or neutral soils

CaD—Calvin channery loam, 15 to 25 percent slopes

Typical Composition

Calvin and similar soils: 85 percent

Dissimilar inclusions: Klinesville—10 percent; moderately well drained, moderately deep soils—2 percent; Hustontown—2 percent; Basher—1 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, red to reddish brown shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 4.1 inches

Inclusions

Dissimilar inclusions:
- Klinesville soils on convex ridgetops and nose slopes
- Some areas of fractured rock outcrops
- Hustontown soils on footslopes
- Moderately deep, moderately well drained soils at the heads of drainageways and on some footslopes
- Very narrow areas of Basher soils along drainageways
- Small, wet weather springs and seeps

Similar inclusions:
- A few, nearly level areas on narrow ridgetops
- Some small areas of soils that have a loamy sand surface layer
- Some small areas of soils that are deep to bedrock
- Some areas of soils that have more clay in the subsoil than the Calvin soil
- Some areas of soils that are yellowish brown and that generally are in alternating bands with reddish soils
- Some areas of slightly acid or neutral soils

CkB—Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes

Typical Composition

Calvin and similar soils: 50 percent
Leck Kill and similar soils: 35 percent
Dissimilar inclusions: Klinesville—5 percent; moderately well drained soils—3 percent; Hustontown—3 percent; short steep slopes—2 percent; Bedington—2 percent

Setting

Landform: Hills
Position on landform: Summits (fig. 9)
Slope: 3 to 8 percent
These soils are so intermingled on the landform that separating them in mapping was not practical. Generally, Calvin soils are on the more convex parts of the landform.

Soil Properties and Qualities

Calvin

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, red to reddish brown shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 4.1 inches

Leck Kill

Texture of the surface layer: Channery silt loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, red shale, siltstone and siltstone
Flooding: None
Available water capacity: Mainly 7.4 inches

Inclusions

Dissimilar inclusions:
- Some shallow areas of Klinesville soils on convex ridgetops and backslopes
- Some areas of thin-bedded, fractured shale outcrops
- Moderately deep, moderately well drained soils at the heads of drainageways and in other concave areas
- Hustontown soils on toeslopes and footslopes

Similar inclusions:
- Some small areas of soils that have a loamy sand surface layer
- Some areas of soils that are yellowish brown and that are generally in alternating bands with reddish soils
- A few areas of slightly acid or neutral soils
- Some small areas of soils that are more than 60 inches deep to fractured shale bedrock

CoC—Carbo silty clay loam, 8 to 15 percent slopes

Typical Composition

Carbo and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—3 percent;

Figure 9.—Cropland on Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes, is highly productive.

Funkstown—3 percent; shallow soils—9 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Backslopes
Slope: 8 to 15 percent
Some areas have karst topography, sinkholes, and closed depressions. The bedrock is steeply tilted under these soils, and depth to bedrock may vary greatly within short distances.

Soil Properties and Qualities

Texture of the surface layer: Silty clay loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 4.9 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils in some swales and depressions
- In some drainageways narrow areas of alluvial Funkstown soils, which are subject to frequent flooding of very brief duration in early spring
- Areas of rock outcrop and sinkholes

Similar inclusions:
- Areas of soils that have limestone bedrock at a depth of less than 20 inches or more than 40 inches
- A few areas of soils that are silt loam and silty clay loam throughout
- Some areas of brownish yellow and brown soils
- A few areas of soils that are more than 10 percent sandstone fragments in the upper part

CoD—Carbo silty clay loam, 15 to 25 percent slopes

Typical Composition

Carbo and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—5 percent; Funkstown—4 percent; shallow soils—6 percent
Some areas of the Carbo soil have karst topography.

Setting

Landform: Uplands in the limestone valley
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Silty clay loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 4.8 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils in some swales and depressions
- In some drainageways narrow areas of alluvial

Funkstown soils, which are subject to frequent flooding of very brief duration in early spring
• Some areas of rock outcrops and sinkholes
Similar inclusions:
• Areas of soils that have limestone bedrock at a depth of more than 40 inches or less than 20 inches
• A few areas of soils that are silt loam and silty clay loam throughout
• Some areas of soils that are brownish yellow and brown
• A few areas of soils where sandstone fragments make up more than 10 percent of the upper part

CrC—Cedarcreek very channery loam, 3 to 25 percent slopes

Typical Composition

Cedarcreek and similar soils: 90 percent
Dissimilar inclusions: Buchanan—3 percent; Hazleton—3 percent; poorly drained soils—2 percent; exposed highwalls and bedrock—2 percent
These areas were created when soil and bedrock were excavated above coal deposits. These materials were mixed when they were deposited in huge piles and then backfilled after extraction of the coal.

Setting

Landform: Mountains
Position on landform: Summits
Slope: 3 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Very channery loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: A mixture of soil material and rock fragments disturbed during strip mining
Flooding: None
Available water capacity: Mainly 6.9 inches

Inclusions

Dissimilar inclusions:
• Areas of Buchanan, Dekalb, and Hazleton soils, which have not been altered by surface mining
• Areas of soils that are similar to the Cedarcreek soil but that are poorly drained
• Some areas where closed depressions are ponded
• Some areas of soils that have a seasonal high water table at or near the surface
• A few areas that have a high wall or exposed bedrock
• Some areas with piles of fill material
Similar inclusions:
• Some small areas of soils that are less than 60 inches deep to bedrock
• A few areas of soils that have an extremely channery or flaggy surface layer
• Some areas of soils that are similar to the Cedarcreek soil but that are moderately well drained to somewhat poorly drained

CrF—Cedarcreek extremely channery loam, 25 to 80 percent slopes

Typical Composition

Cedarcreek and similar soils: 90 percent
Dissimilar inclusions: High wall or exposed bedrock—5 percent; poorly drained soils—3 percent; Buchanan—1 percent; Hazleton—1 percent
These areas were created when soil and bedrock were excavated above coal deposits. These materials were mixed when they were deposited in huge piles and then backfilled after the coal was extracted.

Setting

Landform: Mountains
Position on landform: Backslopes
Slope: 25 to 80 percent

Soil Properties and Qualities

Texture of the surface layer: Extremely channery loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: A mixture of soil material and rock fragments disturbed during strip mining
Flooding: None
Available water capacity: Mainly 6.9 inches

Inclusions

Dissimilar inclusions:
• Many areas that have a high wall or exposed bedrock
• Small areas of poorly drained soils
• Some areas where closed depressions are ponded
• Areas of undisturbed Buchanan, Dekalb, and Hazleton soils

Similar inclusions:
- Piles of black, acid carbolith from deep mining activities
- A few areas of soils that are less than 60 inches deep to bedrock
- Areas of moderately well drained to somewhat poorly drained soils
- Some areas of soils that have an extremely channery or extremely flaggy surface layer

CsB—Clarksburg silt loam, 3 to 8 percent slopes

Typical Composition

Clarksburg and similar soils: 85 percent
Dissimilar inclusions: Murrill—5 percent; Hagerstown—5 percent; Penlaw—3 percent; Lindside—2 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Concave toeslopes and swales (fig. 10)
Slope: 3 to 8 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from limestone, calcareous and noncalcareous shale, and sandstone
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 7.8 inches

Inclusions

Dissimilar inclusions:
- Murrill or Hagerstown soils in the more convex positions

Figure 10.—In the foreground an area of Clarksburg silt loam, 3 to 8 percent slopes. Laidig, Hazleton, and Dekalb soils are on the ridge.

• Small areas of Penlaw soils in swales and depressions
• Small, narrow areas of Lindside soils, which are adjacent to streams and are subject to occasional flooding of brief duration
Similar inclusions:
• Some sinkholes that are ponded when the water table is high
• Some small areas of soils that are up to 40 percent cobbles and gravel throughout
• A few areas of soils that are clayey in lower part of the subsoil
• Some areas of soils that are not firm and brittle in the lower part of the subsoil
• A few areas of soils that are loam or sandy loam throughout
• A few areas of moderately deep, moderately well drained soils

DEF—Dekalb and Hazleton soils, 25 to 75 percent slopes, rubbly

Typical Composition

Dekalb and similar soils: 60 percent
Hazleton and similar soils: 25 percent
Dissimilar inclusions: Sideling—5 percent; Buchanan—5 percent; shallow soils—3 percent; soils on moderately steep slopes—2 percent

Setting

Landform: Mountain slopes
Position on landform: Backslopes
Slope: 25 to 75 percent
Some areas of this map unit consist mostly of either Dekalb or Hazleton soils and some consist of both. Dekalb soils are on the more convex parts of the backslopes. Large stones and some boulders cover 15 to 50 percent of the surface.

Soil Properties and Qualities

Dekalb

Texture of the surface layer: Cobbly sandy loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 2.9 inches

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Inclusions

Dissimilar inclusions:
• Areas of moderately well drained Buchanan soils in swales and drainageways
• Some areas of soils that are less than 20 inches deep to sandstone bedrock
• Long, narrow areas of gently sloping soils on ridgetops
• Areas of soils that have sandstone outcrops
Similar inclusions:
• Some areas of soils where stones and boulders cover more than 50 percent of the surface
• A few areas of soils that are redder than both Hazleton and Dekalb soils
• Some areas of soils that are loamy sand and sand throughout

EgB—Elliber very channery silt loam, 3 to 8 percent slopes

Typical Composition

Elliber and similar soils: 90 percent
Dissimilar inclusions: Shallow soils—3 percent; Clarksburg—3 percent; Pecktonville—4 percent

Setting

Landform: Ridges
Position on landform: Summits
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Very channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from cherty limestone
Flooding: None
Available water capacity: Mainly 6.0 inches

Inclusions

Dissimilar inclusions:
• Shallow soils and some rock outcrops on some backslopes and ridgetops
• Clarksburg soils in swales and drainageways

• Pecktonville soils on summits, shoulders, and backslopes
Similar inclusions:
• A few areas of soils that are less than 50 percent rock fragments throughout
• A few areas of soils that have a higher clay content and fewer rock fragments than the Elliber soil
• A few areas of soils where bedrock is less than 60 inches below the surface

EgC—Elliber very channery silt loam, 8 to 15 percent slopes

Typical Composition

Elliber and similar soils: 90 percent
Dissimilar inclusions: Shallow soils—3 percent; Clarksburg—3 percent; Pecktonville—4 percent

Setting

Landform: Ridges
Position on landform: Backslopes and shoulders
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Very channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from cherty limestone
Flooding: None
Available water capacity: Mainly 6.0 inches

Inclusions

Dissimilar inclusions:
• Areas of shallow soils and rock outcrops on some backslopes and ridgetops
• Clarksburg soils in swales and drainageways
Similar inclusions:
• A few areas of soils that are less than 50 percent rock fragments throughout
• A few areas of soils that have a higher clay content and fewer rock fragments than the Elliber soil
• Some areas of soils where bedrock is less than 60 inches beneath the surface

EgD—Elliber very channery silt loam, 15 to 25 percent slopes

Typical Composition

Elliber and similar soils: 90 percent
Dissimilar inclusions: Shallow soils—3 percent; Clarksburg—3 percent; Pecktonville—4 percent

Setting

Landform: Ridges
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Very channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from cherty limestone
Flooding: None
Available water capacity: Mainly 6.0 inches

Inclusions

Dissimilar inclusions:
• Some backslopes have shallow soils and some rock outcrops
• Clarksburg soils in swales and drainageways
• Some narrow, slightly sloping areas on included ridgetops and benches
Similar inclusions:
• A few areas of soils that are less than 50 percent rock fragments throughout
• Some areas of soils that have a higher clay content and fewer rock fragments than the Elliber soil
• A few areas of soils that have bedrock at a depth of less than 60 inches

ErB—Ernest silt loam, 3 to 8 percent slopes

Typical Composition

Ernest and similar soils: 85 percent
Dissimilar inclusions: Brinkerton—5 percent; Atkins—2 percent; Philo—2 percent; small seeps and springs—1 percent; Berks—5 percent

Setting

Landform: Hills
Position on landform: Toe slopes and footslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid shale, siltstone, and some sandstone
Flooding: None

Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 7.3 inches

Inclusions

Dissimilar inclusions:
- Brinkerton soils in some depressions and swales
- Narrow areas of Philo and Atkins soils, which are along streams and drainageways and which are subject to frequent flooding of very brief duration
- Some wooded areas along drainageways where stones cover 1 to 15 percent of the surface

Similar inclusions:
- Some small areas of soils that have fractured shale bedrock at a depth of less than 60 inches
- A few areas of soils that have a very channery surface layer and subsurface layer
- Some areas of somewhat poorly drained soils
- Some areas of less acid soils
- A few areas of soils that are reddish brown throughout the subsoil
- Some areas of soils that are not firm and brittle in the lower part of the subsoil

FrB—Frankstown channery silt loam, 3 to 8 percent slopes

Typical Composition

Frankstown and similar soils: 90 percent
Dissimilar inclusions: Clarksburg—4 percent; Penlaw—3 percent; shallow soils—3 percent

Setting

Landform: Ridges
Position on landform: Summits
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from siliceous and cherty limestone interbedded with calcareous shale and sandstone
Flooding: None
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
- Clarksburg and Penlaw soils in swales and other concave areas
- Shallow soils and a few rock outcrops on some backslopes and ridgetops

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils that are more than 35 percent rock fragments throughout
- A few areas of soils that are firm and brittle in the lower part of the subsoil
- Some areas of soils that have fractured bedrock at a depth of 20 to 40 inches

FrC—Frankstown channery silt loam, 8 to 15 percent slopes

Typical Composition

Frankstown and similar soils: 90 percent
Dissimilar inclusions: Clarksburg—4 percent; Penlaw—3 percent; shallow soils—3 percent

Setting

Landform: Ridges
Position on landform: Shoulders and backslopes (fig. 11)
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from siliceous and cherty limestone interbedded with calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
- Clarksburg and Penlaw soils on footslopes and toeslopes and in narrow swales and drainageways
- Shallow soils and rock outcrops on some backslopes and ridgetops

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils that are more than 35 percent rock fragments throughout
- A few areas of soils that have fractured bedrock at a depth of 20 to 40 inches

FrD—Frankstown channery silt loam, 15 to 25 percent slopes

Typical Composition

Frankstown and similar soils: 85 percent

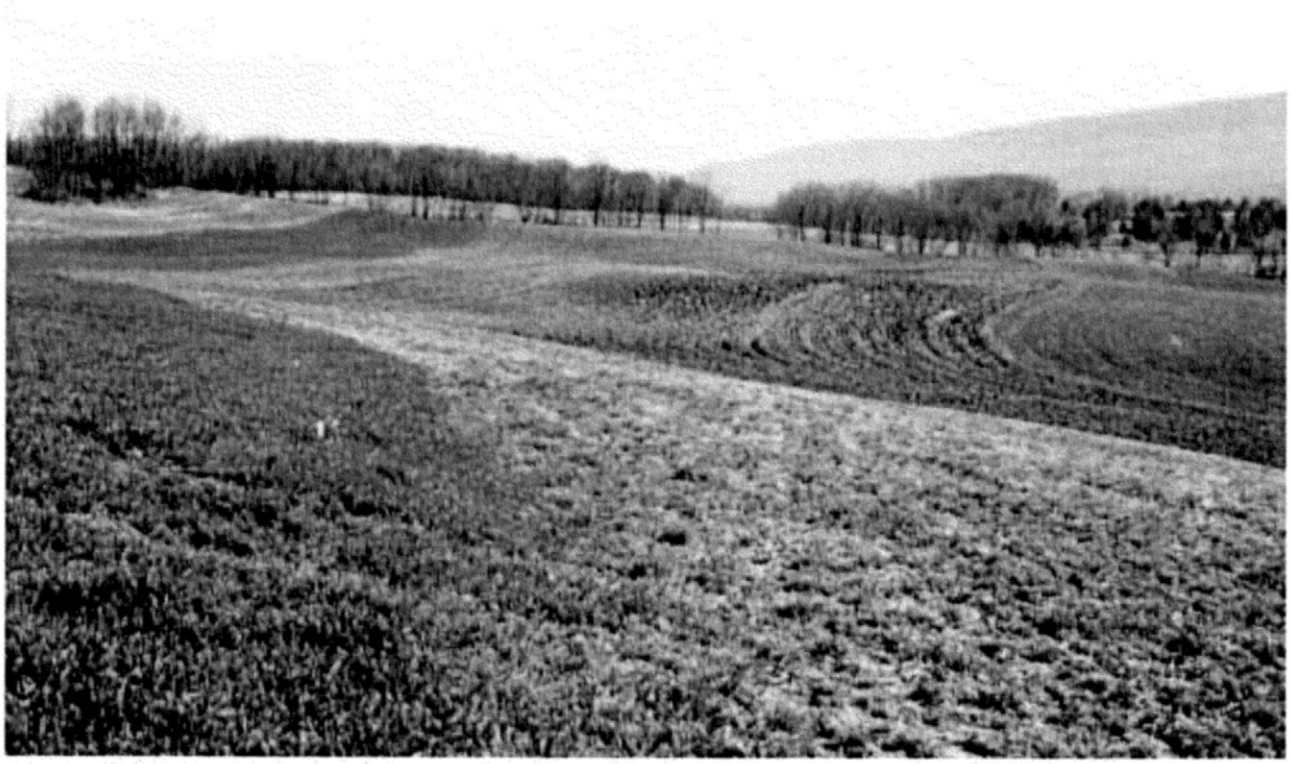

Figure 11.—Contour stripcropping helps to control erosion on Frankstown channery silt loam, 8 to 15 percent slopes.

Dissimilar inclusions: Clarksburg—5 percent; Penlaw—5 percent; shallow soils—5 percent

Setting

Landform: Ridges
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from siliceous and cherty limestone interbedded with calcareous shale and sandstone
Flooding: None
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
- Shallow soils and rock outcrops on some backslopes
- Clarksburg and Penlaw soils on footslopes and toeslopes in narrow swales and drainageways
- Some small, gently sloping areas on narrow knobs, summits, and benches

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils where rock fragments make up more than 35 percent of the volume throughout
- A few areas of soils where fractured bedrock is at a depth of 20 to 40 inches

FrE—Frankstown channery silt loam, 25 to 35 percent slopes

Typical Composition

Frankstown and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—5 percent; gently sloping soils—5 percent; shallow soils—5 percent

Setting

Landform: Ridges
Position on landform: Backslopes
Slope: 25 to 35 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from siliceous and cherty limestone interbedded with calcareous shale and sandstone

Flooding: None
Available water capacity: Mainly 8.9 inches

Inclusions

Dissimilar inclusions:
- Areas of shallow soils and rock outcrops on some backslopes
- Areas of Clarksburg soils on footslopes and toeslopes in narrow swales and drainageways
- Some small, gently sloping areas of soils on narrow knobs, summits, and benches

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils that are more than 35 percent rock fragments throughout
- A few areas of soils that have fractured bedrock at a depth of 20 to 40 inches

Fu—Funkstown silt loam

Typical Composition

Funkstown and similar soils: 85 percent
Dissimilar inclusions: Lindside—8 percent; Clarksburg—5 percent; Carbo—2 percent

Setting

Landform: Swales on uplands in the limestone valley
Position on landform: Toeslopes
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium and alluvium derived from the surrounding soils formed in limestone
Flooding: Frequent
Water table: Apparent (2.0 to 3.5 feet)
Available water capacity: Mainly 8.7 inches
Flooding is generally limited to narrow areas in gullies or concave areas near the center of the map unit. It occurs for only very short periods after intensive rainfall. The other areas of the map unit receive significant amounts of sheet flow from adjoining uplands.

Inclusions

Dissimilar inclusions:
- Clarksburg soils on some toeslopes
- Shallow soils on knobs
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils that have more rock fragments than the Funkstown soil
- A few areas of soils where limestone bedrock is at a depth of 20 to 60 inches

HaB—Hagerstown silt loam, 3 to 8 percent slopes

Typical Composition

Hagerstown and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—5 percent; Funkstown—5 percent; shallow soils—5 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Summits (fig. 12)
Slope: 3 to 8 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 10.5 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils in some swales and depressions
- Areas of shallow, clayey soils on knobs
- In some drainageways narrow areas of alluvial Funkstown soils, which are subject to frequent flooding of very brief duration in early spring
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- A few areas of soils that have a silt loam or silty clay loam surface layer
- Some areas of soils that have more rock fragments than the Hagerstown soil
- A few areas of brownish yellow and brown soils
- Some areas of soils that have limestone bedrock at depth of 20 to 60 inches

HaC—Hagerstown silt loam, 8 to 15 percent slopes

Typical Composition

Hagerstown and similar soils: 85 percent

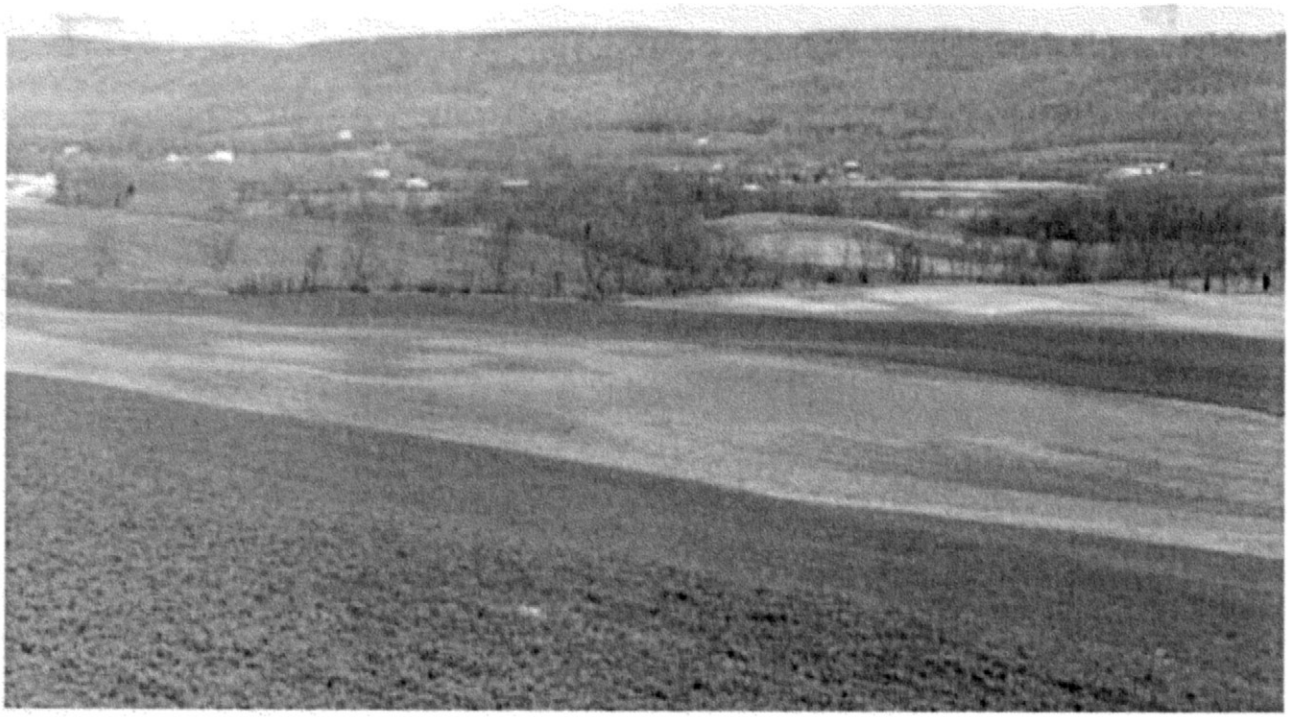

Figure 12.—An area of Hagerstown silt loam, 3 to 8 percent slopes. In the background Murrill soils are in lower positions than Hazleton and Sideling soils on the ridge .

Dissimilar inclusions: Clarksburg—3 percent;
Funkstown—5 percent; shallow soils—7 percent

Setting

Landform: Uplands in the limestone valley
Position on landform: Shoulders
Slope: 8 to 15 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 10.4 inches

Inclusions

Dissimilar inclusions:
- Shallow, clayey soils on some knobs and backslopes
- Clarksburg soils in some swales and depressions
- In some swales and depressions long, narrow areas of alluvial Funkstown soils, which are subject to frequent flooding of very brief duration in early spring
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- A few areas of brownish yellow and brown soils
- Some areas of soils that have limestone bedrock at a depth of 20 to 60 inches
- A few areas of soils that have more rock fragments or less clay throughout than the Hagerstown soil

HbB—Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes

Typical Composition

Hagerstown and similar soils: 65 percent
Carbo and similar soils: 20 percent
Dissimilar inclusions: Clarksburg—4 percent;
Funkstown—5 percent; shallow soils—6 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Summits
Slope: 3 to 8 percent
Some areas have karst topography, sinkholes, and closed depressions. These soils are so intermingled on the landform that it was impractical to separate them in mapping. The bedrock is steeply tilted under these

soils, and depth to bedrock may vary greatly within short distances.

Soil Properties and Qualities

Hagerstown

Texture of the surface layer: Silty clay loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 10.4 inches

Carbo

Texture of the surface layer: Silty clay loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 5.0 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils in swales and depressions
- Shallow, clayey soils on knobs and backslopes
- In some drainageways narrow areas of alluvial Funkstown soils, which are subject to frequent flooding of very brief duration in early spring
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- A few areas of soils that are silt loam and silty clay loam in the subsoil
- Some areas of soils that have more rock fragments than the Hagerstown and Carbo soils
- A few areas of brownish yellow and brown soils
- Some areas of soils that have limestone bedrock at a depth of 40 to 60 inches

HkE—Hagerstown-Rock outcrop complex, 8 to 35 percent slopes

Typical Composition

Hagerstown and similar soils: 70 percent
Rock outcrop: 15 percent
Dissimilar inclusions: Clarksburg—2 percent; Funkstown—3 percent; shallow soils—10 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Backslopes
Slope: 8 to 35 percent
Some areas have karst topography, sinkholes, and closed depressions. The limestone outcrops and ledges are 2 to 20 feet apart.

Soil Properties and Qualities

Hagerstown

Texture of the surface layer: Silty clay loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone
Flooding: None
Available water capacity: Mainly 10.4 inches

Rock outcrop

Texture of the surface layer: Unweathered bedrock
Parent material: Limestone
Flooding: None
Available water capacity: None
In some areas more than 15 percent of the surface consists of limestone rocks or ledge outcrops

Inclusions

Dissimilar inclusions:
- A few areas of soils that have limestone bedrock at a depth of less than 20 inches below the surface
- Clarksburg soils on some swales and footslopes
- Some sinkholes
- In some drainageways narrow areas of alluvial Funkstown soils, which are subject to frequent flooding of very brief duration in early spring

Similar inclusions:
- A few areas of soils that are less than 35 percent clay or more than 15 percent rock fragments in the surface layer and subsoil
- A few areas of soils that are brownish yellow and brown in the subsoil
- Some areas of soils that have limestone bedrock at a depth of 20 to 60 inches

HOD—Hazleton and Clymer soils, 8 to 25 percent slopes, extremely stony

Typical Composition

Hazleton and similar soils: 45 percent
Clymer and similar soils: 40 percent
Dissimilar inclusions: Buchanan—5 percent; shallow soils—5 percent; very steep slopes—2 percent; Dekalb—2 percent; areas that have a rubbly surface—1 percent

Setting

Landform: Mountains

Position on landform: Backslopes
Slope: 8 to 25 percent
Some areas consist mostly of either Hazleton or Clymer soils and some consist of both. Generally, Hazleton soils are on the more convex parts of the landform. Large stones and some boulders cover 3 to 15 percent of the surface.

Soil Properties and Qualities

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Clymer

Texture of the surface layer: Channery loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from acid, gray and brown sandstone, shale, and siltstone
Flooding: None
Available water capacity: Mainly 5.5 inches

Inclusions

Dissimilar inclusions:
- Some areas of soils that are less than 20 inches deep to sandstone bedrock
- Buchanan soils on toeslopes, footslopes, and swales
- Small, very narrow areas of alluvial soils along streams and drainageways
- A few areas of soils that have sandstone outcrops

Similar inclusions:
- Some areas of soils that have more clay than Clymer and Hazleton soils
- A few areas of soils that are firm and brittle in the lower layer
- Some small areas of soils that have been cleared of surface stones
- A few areas of soils that have sandstone bedrock at a depth of 20 to 40 inches
- A few areas of soils that are redder than the Clymer and Hazleton soil

HRB—Hazleton and Dekalb soils, 0 to 8 percent slopes, extremely stony

Typical Composition

Hazleton and similar soils: 50 percent
Dekalb and similar soils: 40 percent
Dissimilar inclusions: Buchanan—5 percent; Sideling—5 percent

Setting

Landform: Mountains
Position on landform: Summits and shoulders
Slope: 0 to 8 percent
Some areas consist mostly of Hazleton or Dekalb soils and some consist of both. Generally, Dekalb soils are on the more convex parts of the landform. Large stones and some boulders cover 3 to 15 percent of the surface.

Soil Properties and Qualities

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Dekalb

Texture of the surface layer: Cobbly sandy loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 2.9 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils in swales
- Some areas of soils that have short, steep slopes
- A few areas of soils that are less than 20 inches deep to sandstone bedrock

Similar inclusions:
- A few areas of soils that have a loamy sand or sand surface layer
- Some areas of soils that have stones and boulders on more than 15 percent of the surface
- A few areas of soils that have shale rock fragments

and that are underlain by shale and siltstone bedrock
• Some areas of soils that are redder than Hazleton soils
• Some small areas of soils that have been cleared of surface stones

HRD—Hazleton and Dekalb soils, 8 to 25 percent slopes, extremely stony

Typical Composition

Hazleton and similar soils: 55 percent
Dekalb and similar soils: 35 percent
Dissimilar inclusions: Buchanan—5 percent; Sideling—5 percent

Setting

Landform: Mountains
Position on landform: Backslopes and shoulders
Slope: 8 to 25 percent
Some areas consist mostly of Hazleton or Dekalb soils and some consist of both. Generally, Dekalb soils are on the more convex parts of the landform. Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Dekalb

Texture of the surface layer: Cobbly sandy loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 2.9 inches

Inclusions

Dissimilar inclusions:
• Moderately well drained Buchanan soils on toeslopes, on footslopes, and in drainageways
• Narrow areas of alluvial soils along streams and in drainageways
• A few areas of soils that are less than 20 inches deep to sandstone bedrock
• Some small areas of soils that are on very steep slopes or that have sandstone outcrops
Similar inclusions:
• A few areas of soils that are firm and brittle in the lower layer
• Some areas of soils that are redder than Dekalb and Hazleton soils
• A few areas of soils that have shale fragments and that are underlain by shale and siltstone bedrock
• Some small areas of soils that have been cleared of surface stones
• A few areas of soils that have a loamy sand and sand surface layer
• Some areas of soils where stones and boulders cover more than 15 percent of the surface

HRF—Hazleton and Dekalb soils, 25 to 75 percent slopes, extremely stony

Typical Composition

Hazleton and similar soils: 65 percent
Dekalb and similar soils: 25 percent
Dissimilar inclusions: Buchanan—5 percent; Sideling—5 percent

Setting

Landform: Mountains
Position on landform: Backslopes
Slope: 25 to 75 percent
Some areas consist mostly of Hazleton or Dekalb soils and some consist of both. Commonly, Dekalb soils are on the more convex parts of the landform. Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Dekalb

Texture of the surface layer: Cobbly sandy loam

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 2.9 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained Buchanan soils on foot slopes and drainageways
- Some narrow areas of alluvial soils along streams and drainageways

Similar inclusions:
- A few areas of soils that are firm and brittle in the lower layer
- Some areas of soils that are redder than Dekalb and Hazleton soils
- A few areas of soils that have shale rock fragments and that are underlain by shale and siltstone bedrock
- A few areas of soils that have a loamy sand or sand surface layer
- Some areas of soils where stones and boulders cover more than 15 percent of the surface

HwB—Hustontown silt loam, 3 to 8 percent slopes

Typical Composition

Hustontown and similar soils: 85 percent
Dissimilar inclusions: Calvin—8 percent; Leck Kill—3 percent; Brinkerton—2 percent; Basher—2 percent

Setting

Landform: Hills
Position on landform: Footslopes and toeslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from acid, red shale, siltstone, and sandstone
Flooding: None
Water table: Perched (1.5 to 3.0 feet)
Available water capacity: Mainly 6.4 inches

Inclusions

Dissimilar inclusions:
- Basher soils, which are subject to occasional flooding of brief duration and are in long, narrow strips along streams, in concave drainageways, and in adjacent areas
- Brinkerton soils in depressions and swales
- A few small areas of Calvin and Leck Kill soils on slight rises and on the more convex backslopes
- Along drainageways and in some wooded areas a few stony areas, generally adjacent to sandstone ridges
- Some small seep spots and springs

Similar inclusions:
- A few areas of soils that have a very channery surface layer
- A few areas of soils where reaction is neutral
- Some areas have soils that are not firm and brittle in the lower part of the subsoil
- Small areas of soils that have bedrock at a depth of less than 60 inches
- Some areas of soils that have a very gravelly or extremely gravelly subsoil

Jg—Jugtown-Lindside silt loams

Typical Composition

Jugtown and similar soils: 50 percent
Lindside and similar soils: 35 percent
Dissimilar inclusions: Clarksburg—5 percent; Monongahela—3 percent; Melvin—5 percent; very gravelly areas—2 percent

Setting

Landform: Flood plains
Slope: 0 to 3 percent
Jugtown soils are in slightly higher positions than Lindside soils. These soils are so intermingled on the landform that it was not practical to separate them in mapping.

Soil Properties and Qualities

Jugtown

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Alluvium washed from soils derived from limestone, shale, and sandstone
Flooding: Occasional
Water table: Apparent (1.5 to 2.5 feet)
Available water capacity: Mainly 12.6 inches

Lindside

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)

Drainage class: Moderately well drained
Parent material: Alluvium washed from soils derived from limestone and calcareous shale and sandstone
Flooding: Frequent
Water table: Apparent (1.5 to 3.0 feet)
Available water capacity: Mainly 11.5 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils on the lower toeslopes and on colluvial fans
- Monongahela soils on small terraces
- A few areas of very gravelly soils in drainageways near major ridges
- Melvin soils in slackwater areas and depressions, the small, closed ones of which are subject to frequent ponding

Similar inclusions:
- A few areas of soils that have a clayey subsoil and substratum
- Some small areas of soils that are very gravelly above a depth of 40 inches
- A few areas of soils that have a very acid solum and substratum
- Some areas of soils that have a reddish solum and substratum
- Small areas of somewhat poorly drained, alluvial soils

KaB—Klinesville channery silt loam, 3 to 8 percent slopes

Typical Composition

Klinesville and similar soils: 85 percent
Dissimilar inclusions: Moderately well drained soils—6 percent; Hustontown—6 percent; Basher—2 percent; slightly acid or neutral soils—1 percent

Setting

Landform: Hills
Position on landform: Summits
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 1.1 inches

Inclusions

Dissimilar inclusions:
- Moderately deep, moderately well drained soils at the heads of drainageways and in other concave areas
- Hustontown soils on toeslopes and footslopes
- A few, very narrow areas of Basher soils along drainageways
- Some sandstone and shale outcrops

Similar inclusions:
- Some areas of soils that have a reddish brown to brown sandy subsoil and substratum
- Some areas of yellowish brown soils that are in alternating bands with reddish soils
- A few areas of slightly acid or neutral soils
- A few areas of soils that have a higher clay content than the Klinesville soil
- Some small areas of soils that are more than 20 inches deep to bedrock

KaC—Klinesville channery silt loam, 8 to 15 percent slopes

Typical Composition

Klinesville and similar soils: 85 percent
Dissimilar inclusions: Moderately well drained soils—6 percent; Hustontown—6 percent; Basher—2 percent; slightly acid or neutral soils—1 percent

Setting

Landform: Hills
Position on landform: Shoulders and backslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Moderately well drained
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 1.1 inches

Inclusions

Dissimilar inclusions:
- Moderately deep, moderately well drained soils at the heads of drainageways and in other concave areas
- Hustontown soils on toeslopes and footslopes
- A few very narrow areas of Basher soils along drainageways
- Some areas of small, wet weather springs and seeps
- A few areas of sandstone and shale outcrops

Similar inclusions:
- Some areas of soils that have a reddish brown to brown sandy subsoil and substratum
- Some areas of yellowish brown soils in alternating bands with reddish soils
- A few areas of slightly acid or neutral soils
- A few areas of soils that have a higher clay content than the Klinesville soil
- Some small areas of soils that are more than 20 inches deep to bedrock

KaD—Klinesville channery silt loam, 15 to 25 percent slopes

Typical Composition

Klinesville and similar soils: 85 percent
Dissimilar inclusions: Moderately well drained soils—6 percent; Hustontown—6 percent; Basher—2 percent; slightly acid or neutral soils—1 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 1.1 inches

Inclusions

Dissimilar inclusions:
- Moderately deep, moderately well drained soils at the heads of drainageways and on some backslopes
- Hustontown soils on toeslopes and footslopes
- Very narrow areas of alluvial soils along drainageways
- Some areas of soils that have a stony or very stony surface layer

Similar inclusions:
- Some areas of soils that have a reddish brown to brown sandy subsoil and substratum
- A few areas of yellowish brown soils in alternating bands with reddish soils
- Some areas of slightly acid or neutral soils
- Some small areas of soils that are more than 20 inches deep to bedrock
- A few areas of soils that have a higher clay content than the Klinesville soil

KWF—Klinesville and Weikert soils, 25 to 60 percent slopes

Typical Composition

Klinesville and similar soils: 45 percent
Weikert and similar soils: 45 percent
Dissimilar inclusions: Moderately well drained soils—4 percent; Hustontown—4 percent; Leck Kill—1 percent; moderately sloping or gently sloping soils—1 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 25 to 60 percent
Note: Some areas consist mostly of Klinesville or Weikert soils, and some areas consist of both soils.

Soil Properties and Qualities

Klinesville

Texture of the surface layer: Very channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Flooding: None
Available water capacity: Mainly 1.0 inches

Weikert

Texture of the surface layer: Very channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Parent material: Residuum derived from gray and brown, acid shale, siltstone, and fine grained sandstone
Flooding: None
Available water capacity: Mainly 1.2 inches

Inclusions

Dissimilar inclusions:
- Moderately deep, moderately well drained soils at the heads of drainageways and on some backslopes
- Hustontown soils on concave backslopes, toeslopes, and footslopes
- A few areas of soils that have subrounded or flat stones on 3 to 15 percent of the surface
- Shale outcrops on some narrow ridgetops and on some backslopes

Similar inclusions:
- Some small areas of soils that are more than 20 inches deep to bedrock
- Some areas of soils that have a sandy subsoil and substratum

- A few areas of soils that have a higher clay content than Klinesville and Weikert soils
- Some areas of slightly acid or neutral soils

LaB—Laidig gravelly loam, 3 to 8 percent slopes

Typical Composition

Laidig and similar soils: 85 percent
Dissimilar inclusions: Buchanan—7 percent; Berks—8 percent

Setting

Landform: Mountain slopes and benches
Position on landform: Toeslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 5.7 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils on concave footslopes
- A few areas of soils that have a stony surface layer
- Moderately deep, skeletal Berks soils on knobs and in other convex positions
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to occasional flooding of brief duration

Similar inclusions:
- Some areas of slightly acid or neutral soils
- A few areas of soils that are reddish brown throughout the subsoil or that are clayey below a depth of 40 inches
- Some areas of soils that are not firm and brittle in the lower part of the subsoil

LaC—Laidig gravelly loam, 8 to 15 percent slopes

Typical Composition

Laidig and similar soils: 85 percent
Dissimilar inclusions: Buchanan—7 percent; Berks—8 percent

Setting

Landform: Mountain slopes and benches
Position on landform: Footslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 5.7 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils on the more concave parts of the slope
- A few areas of soils that have short, steep slopes or that have a stony surface layer
- Moderately deep, skeletal Berks soils on knobs and in other, more convex positions on backslopes

Similar inclusions:
- Some areas of slightly acid or neutral soils
- A few areas of soils that are reddish brown throughout the subsoil or that are clayey below a depth of 40 inches
- Some areas of soils that are not firm and brittle in the lower part of the subsoil

LbB—Laidig gravelly loam, 0 to 8 percent slopes, extremely stony

Typical Composition

Laidig and similar soils: 85 percent
Dissimilar inclusions: Buchanan—7 percent; Berks—6 percent; Andover—2 percent

Setting

Landform: Mountain slopes and benches
Position on landform: Toeslopes
Slope: 0 to 8 percent
Note: Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam

Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 5.5 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils near drainageways and in concave areas
- Berks soils on knobs and in the more convex areas on backslopes
- A few small areas of soils that have short, steep slopes or that do not have a stony surface layer
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to occasional flooding of brief duration

Similar inclusions:
- A few areas of soils that are reddish brown throughout the subsoil
- Some areas of soils where stones and boulders cover more than 15 percent of the soil surface
- A few areas of clayey soils
- Some areas of soils that are not firm and brittle in the lower part of the subsoil

LbD—Laidig gravelly loam, 8 to 25 percent slopes, extremely stony

Typical Composition

Laidig and similar soils: 85 percent
Dissimilar inclusions: Buchanan—7 percent; Berks—6 percent; Andover—2 percent

Setting

Landform: Mountain slopes and backslopes
Position on landform: Footslopes
Slope: 8 to 25 percent
Large stones and some boulders cover 3 to 15 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 5.5 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils on the more concave parts of the slope and on benches
- Andover soils in some depressions and swales
- Moderately deep, skeletal Berks soils on knobs and in the more convex areas on backslopes
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- Some small areas of soils that are redder than the Laidig soil
- A few small areas of clayey soils
- Some areas of soils that are not firm and brittle in the lower layer
- A few areas of soils that have more than 15 percent stones and boulders on the surface
- Some small areas of soils that have been cleared of surface stones

LCE—Laidig and Hazleton soils, 25 to 60 percent slopes, extremely stony

Typical Composition

Laidig and similar soils: 45 percent
Hazleton and similar soils: 45 percent
Dissimilar inclusions: Buchanan—5 percent; alluvial soils—1 percent; Berks—2 percent; rubbly areas—2 percent

Setting

Landform: Mountain slopes
Position on landform: Backslopes
Slope: 25 to 50 percent
Some areas consist mostly of Laidig or Hazleton soils, and some consist of both soils. Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Laidig

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 5.5 inches

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained Buchanan soils on foot slopes and in drainageways
- Narrow areas of alluvial soils along streams and in drainageways

Similar inclusions:
- Some areas of soils where stones and boulders cover more than 15 percent of the surface
- A few areas of soils that are redder than Laidig and Hazleton soils
- Some areas of slightly acid or neutral soils
- Some areas of soils that are not firm and brittle in the lower part of the subsoil

Ln—Lindside silt loam

Typical Composition

Lindside and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—5 percent; Monongahela—5 percent; Melvin—5 percent

Setting

Landform: Flood plains
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Alluvium washed from soils derived from limestone and calcareous shale and sandstone
Flooding: Frequent
Water table: Apparent (1.5 to 3.0 feet)
Available water capacity: Mainly 11.5 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils on the lower toeslopes and in colluvial fans
- Monongahela soils on small terraces generally separated from Lindside soils by short escarpments
- Melvin soils in depressions and slackwater areas

Similar inclusions:
- Some areas of soils that have a thick, dark surface layer
- Some small areas of soils that are very gravelly above a depth of 40 inches
- Some small areas of soils that are better drained than the Lindside soil
- A few areas of soils that have a clayey subsoil and substratum

Me—Melvin silt loam

Typical Composition

Melvin and similar soils: 85 percent
Dissimilar inclusions: Penlaw—5 percent; Tyler—5 percent; Lindside—5 percent

Setting

Landform: Flood plains
Slope: 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Stratified alluvium derived from soils underlain by limestone and calcareous shale on uplands
Flooding: Frequent
Water table: Apparent (0 to 1.0 feet)
Available water capacity: Mainly 12.1 inches

Inclusions

Dissimilar inclusions:
- Lindside soils in the slightly higher areas in the map unit and generally nearer the present stream channels
- Penlaw soils on the lower toeslopes
- Tyler soils on small terraces that are generally separated from Melvin soils by short escarpments and that in places are subject to rare flooding

Similar inclusions:
- In drainageways near major ridges some areas of soils that have a stony surface layer
- A few areas of soils that have a sandy or very gravelly surface layer
- Some areas of soils that have a clayey subsoil and substratum

MoB—Monongahela silt loam, 3 to 8 percent slopes

Typical Composition

Monongahela and similar soils: 85 percent
Dissimilar inclusions: Purdy—3 percent; Brinkerton—3 percent; steep slopes—6 percent; shallower soils—3 percent

Setting

Landform: Terraces
Slope: 3 to 8 percent
This soil is about 5 to 75 feet above the present flood plain. In some places short escarpments are at the boundary of adjacent flood plains.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Old alluvium washed from soils on uplands underlain by acid sandstone and shale
Flooding: None
Water table: Perched (0 to 0.5 feet)
Available water capacity: Mainly 8.2 inches

Inclusions

Dissimilar inclusions:
- Brinkerton soils generally in depressions on toeslopes
- Purdy soils in slackwater areas and depressions that are subject to common ponding for brief periods

Similar inclusions:
- Some areas of soils that are not firm and brittle in the lower layer
- Some areas of soils that have bedrock at a depth of less than 60 inches
- A few areas of soils that have more than 15 percent rounded gravel and cobbles in the upper part of the horizon
- Some small areas of soils that are clayey or are redder than the Monongahela soil
- Some areas of slightly acid or neutral soils

MrB—Murrill gravelly loam, 3 to 8 percent slopes

Typical Composition

Murrill and similar soils: 80 percent
Dissimilar inclusions: Clarksburg—10 percent; Funkstown—10 percent

Setting

Landform: Footslopes of ridges in the limestone valley
Position on landform: Slightly convex hill slopes (fig. 13)
Slope: 3 to 8 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Colluvium that was derived from sandstone, siltstone, and shale and that was deposited over limestone
Flooding: None
Available water capacity: Mainly 7.3 inches

Inclusions

Dissimilar inclusions:
- Concave areas of Clarksburg soils that are generally slightly lower on the landform than the Murrill soil
- A few areas of soils that have a stony surface layer
- Areas of Funkstown soils that are along drainageways and that are subject to very brief flooding

Similar inclusions:
- A few areas of red or clayey soils
- Some areas of soils that have a cobbly to extremely cobbly surface layer

MrC—Murrill gravelly loam, 8 to 15 percent slopes

Typical Composition

Murrill and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—8 percent; Funkstown—7 percent

Setting

Landform: Footslopes of ridges in the limestone valley
Position on landform: Slightly convex hill slopes
Slope: 8 to 15 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained

Figure 13.—Murrill gravelly loam, 3 to 8 percent slopes, planted to corn, at the base of Tuscarora Mountain. A prime farmland soil, it is used for both hay and corn. It has a potential productivity of 3.5 tons per acre for grass-legume hay and 24 tons per acre for corn silage.

Parent material: Colluvium that was derived from sandstone, siltstone, and shale and that was deposited over limestone
Flooding: None
Available water capacity: Mainly 7.3 inches

Inclusions

Dissimilar inclusions:
- Concave areas of Clarksburg soils that are generally slightly lower on the landform than the Murrill soil
- A few areas of soils that have short, very steep slopes
- A few areas of soils that have a stony surface layer

Similar inclusions:
- A few areas of clayey soils
- A few areas of soils that are firm and brittle in the lower part of the subsoil
- Some areas of soils that have a cobbly to extremely cobbly surface layer

MvD—Murrill gravelly loam, 8 to 25 percent slopes, extremely stony

Typical Composition

Murrill and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—10 percent; alluvial soils—5 percent

Setting

Landform: Footslopes of ridges in the limestone valley
Position on landform: Slightly convex hillslopes
Slope: 8 to 25 percent
Some areas have karst topography, sinkholes, and closed depressions. Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained

Parent material: Colluvium that was derived from sandstone, siltstone, and shale and that was deposited over limestone
Flooding: None
Available water capacity: Mainly 7.3 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils generally slightly lower on the landform than and more concave in shape than the Murrill soil
- Alluvial soils that are in narrow areas along drainageways and that are subject to occasional flooding of brief duration

Similar inclusions:
- Some small areas of soils that have been cleared of surface stones
- A few areas of soils that have bedrock at a depth of 20 to 60 inches
- Some areas of soils that have a cobbly to extremely cobbly surface layer

PcB—Pecktonville gravelly silt loam, 3 to 8 percent slopes

Typical Composition

Pecktonville and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—5 percent; Elliber—3 percent; Wurno—4 percent; Nollville—3 percent

Setting

Landform: Ridges in the limestone valley
Position on landform: Summits
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone rock containing chert
Flooding: None
Water table: Apparent (3.5 to 6.0 feet)
Available water capacity: Mainly 9.3 inches

Inclusions

Dissimilar inclusions:
- Clarksburg soils in some swales and depressions
- A few scattered areas of shallow soils on knobs
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- Some areas of soils that have more rock fragments

PcC—Pecktonville gravelly silt loam, 8 to 15 percent slopes

Typical Composition

Pecktonville and similar soils: 85 percent
Dissimilar inclusions: Clarksburg—4 percent; Elliber—5 percent; Wurno—4 percent; Nollville—2 percent

Setting

Landform: Ridges in the limestone valley
Position on landform: Backslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone rock containing chert
Flooding: None
Water table: Apparent (3.5 to 6.0 feet)
Available water capacity: Mainly 9.3 inches

Inclusions

Dissimilar inclusions:
- Wurno and Nollville soils are on the more convex positions.
- Clarksburg soils in some swales and depressions
- A few scattered areas of shallow soils on knobs
- Some areas of rock outcrops and sinkholes

Similar inclusions:
- Some areas of soils that have more rock fragments than the Pectonville soil

PeE—Pecktonville-Rock outcrop complex, 25 to 45 percent slopes

Typical Composition

Pecktonville and similar soils: 70 percent
Rock outcrop: 15 percent
Dissimilar inclusions: Clarksburg—2 percent; Elliber—5 percent; Wurno—6 percent; Nollville—2 percent

Setting

Landform: Ridges in the limestone valley
Position on landform: Backslopes

Slope: 25 to 45 percent
Pecktonville soils and areas of Rock outcrop are so intermingled on the landform that it was not practical to separate them in mapping.

Soil Properties and Qualities

Pecktonville

Texture of the surface layer: Gravelly silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from limestone rock containing chert
Flooding: None
Water table: Apparent (3.5 to 6.0 feet)
Available water capacity: Mainly 9.3 inches

Rock outcrop

Texture of the surface layer: Unweathered bedrock
Parent material: Cherty limestone
Flooding: None
Available water capacity: None

Inclusions

Dissimilar inclusions:
- Wurno and Nollville soils are on the more convex positions.
- Areas of soils that have limestone bedrock at a depth of less than 20 inches
- Some small areas of gently sloping soils on knobs and summits
- Areas of Clarksburg soils in some swales and on footslopes

Similar inclusions:
- Some areas of soils where limestone rocks or outcropping ledges cover more than 15 percent of the surface
- Some areas of soils that have a stony surface layer

Pg—Penlaw silt loam, 0 to 3 percent slopes

Typical Composition

Penlaw and similar soils: 85 percent
Dissimilar inclusions: Poorly drained soils—6 percent; Melvin—4 percent; Murrill—3 percent; Hagerstown—2 percent

Setting

Landform: Low hills in the limestone valley
Position on landform: Concave toeslopes
Slope: 0 to 3 percent
Some areas have karst topography, sinkholes, and closed depressions.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Colluvium derived from limestone, calcareous and noncalcareous shale, and sandstone
Flooding: None
Water table: Perched (0.5 to 1.5 feet)
Available water capacity: Mainly 9.1 inches

Inclusions

Dissimilar inclusions:
- Poorly drained soils in swales and in slightly lower positions than those of the Penlaw soil
- Murrill or Hagerstown soils in the more convex positions
- Small, narrow areas of Melvin soils that are adjacent to streams and that are subject to frequent flooding of very brief duration

Similar inclusions:
- A few areas of soils that are not firm and brittle in the lower part of the subsoil
- Some small areas of moderately deep soils
- A few areas of soils that have a thick surface layer
- Some small areas of soils that are up to 50 percent cobbles and gravel throughout

Ph—Philo silt loam

Typical Composition

Philo and similar soils: 85 percent
Dissimilar inclusions: Ernest—6 percent; Brinkerton—4 percent; Atkins—5 percent

Setting

Landform: Flood plains
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Alluvium washed from soils on uplands underlain by acid shale, siltstone, and sandstone
Flooding: Occasional
Water table: Apparent (1.5 to 3.0 feet)
Available water capacity: Mainly 7.0 inches

Inclusions

Dissimilar inclusions:
- Ernest and Brinkerton soils on the lower toeslopes and on colluvial fans
- Atkins soils in backwater areas and depressions, of which some of the small, closed ones are subject to frequent ponding
- Very stony soils in some drainageways near major ridges

Similar inclusions:
- Some areas of soils that are very gravelly or extremely gravelly in the subsoil
- A few areas of soils that are loamy sand to sand above a depth of 40 inches
- Some areas of slightly acid or neutral soils
- A few areas of soils that have more clay in the subsoil than the Philo soil
- Some small areas of soils that are redder throughout than the Philo soil

Po—Pope silt loam

Typical Composition

Pope and similar soils: 85 percent
Dissimilar inclusions: Ernest—5 percent; Brinkerton—3 percent; Atkins—5 percent; Monongahela—2 percent

Setting

Landform: Flood plains
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Alluvium washed from soils on uplands underlain by acid sandstone, siltstone, and shale
Flooding: Occasional
Available water capacity: Mainly 8.9 inches

Inclusions

Dissimilar inclusions:
- Monongahela soils on low terraces that are subject to rare flooding or that are not subject to flooding
- Ernest and Brinkerton soils on the lower toe slopes and on colluvial fans
- Very stony soils in drainageways near major ridges
- Atkins soils in slightly lower areas than those of the Pope soil

Similar inclusions:
- A few areas of soils that have a very gravelly or extremely gravelly subsoil
- A few areas of soils that are loamy sand to sand above a depth of 40 inches
- Some areas of slightly acid or neutral soils

Pu—Purdy silty clay loam

Typical Composition

Purdy and similar soils: 85 percent
Dissimilar inclusions: Tyler—10 percent; Monongahela—3 percent; Ernest—2 percent

Setting

Landform: Terraces and backswamps
Slope: 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Silty clay loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Parent material: Alluvium washed from soils on uplands underlain by shale and siltstone
Flooding: None
Water table: Apparent (-1.0 to 0.5 feet)
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
- Tyler and Monongahela soils on slightly higher terraces than those of the Purdy soil
- Ernest soils on toeslopes

Similar inclusions:
- Some small areas of very poorly drained soils
- A few areas of soils that have less clay throughout than the Purdy soil
- Some areas of soils where bedrock is less than 60 inches deep
- Some areas of soils that are more than 10 percent, by volume, rounded gravel and cobbles
- A few areas of slightly acid or neutral soils
- Some areas of soils that are subject to brief flooding or ponding during wet seasons

Q—Quarries

Typical Composition

Quarries: 100 percent
Open excavations from which limestone, shale, or sandstone bedrock or deposits of sand or gravel were

removed. Most of the bottom and the nearly perpendicular sidewalls are exposed bedrock. Soil material, rock fragments, stones, boulders, and other waste material have been removed from the quarry, or pit, and have been piled around or near it.

Setting

Landform: Valleys or mountains
Slope: 0 to 100 percent
Some quarries have been abandoned, but many are active. A few have been backfilled and smoothed. Most quarries are barren or have only sparse vegetation, and some are filled with water. Some areas have been in use as landfills for commercial, industrial, and residential waste material.

Soil Properties and Qualities

Texture of the surface layer: Unweathered bedrock
Flooding: None
Available water capacity: None

SeB—Sideling gravelly loam, 3 to 8 percent slopes

Typical Composition

Sideling and similar soils: 85 percent
Dissimilar inclusions: Berks—10 percent; moderately well drained, moderately deep soils—5 percent

Setting

Landform: Mountain slopes
Position on landform: Toeslopes
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.5 inches

Inclusions

Dissimilar inclusions:
- A few areas of stony soils
- Berks soils on knobs and in other convex positions
- Alluvial soils that are in narrow areas along drainageways and that are subject to occasional flooding of brief duration

Similar inclusions:
- A few areas of soils that are firm and brittle in the lower part of the subsoil

SeC—Sideling gravelly loam, 8 to 15 percent slopes

Typical Composition

Sideling and similar soils: 85 percent
Dissimilar inclusions: Berks—10 percent; moderately deep, moderately well drained soils—5 percent

Setting

Landform: Mountain slopes
Position on landform: Foot slopes and backslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.5 inches

Inclusions

Dissimilar inclusions:
- A few areas of soils that have short, steep slopes or that are stony
- Berks soils on knobs and in other convex positions
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- A few areas of soils that are very firm and brittle in the lower part of the subsoil

SeD—Sideling gravelly loam, 15 to 25 percent slopes

Typical Composition

Sideling and similar soils: 90 percent
Dissimilar inclusions: Buchanan—5 percent; Weikert—2 percent; stony soils—2 percent; alluvial soils—1 percent

Setting

Landform: Mountain slopes

Position on landform: Footslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.5 inches

Inclusions

Dissimilar inclusions:
- A few areas of soils that have short, steep slopes or that are stony
- Weikert soils on knobs and in other convex positions
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- A few areas of soils that are very firm and brittle in the lower part of the subsoil

SrB—Sideling gravelly loam, 0 to 8 percent slopes, extremely stony

Typical Composition

Sideling and similar soils: 85 percent
Dissimilar inclusions: Buchanan—10 percent; Weikert—5 percent

Setting

Landform: Mountain slopes
Position on landform: Toeslopes and footslopes
Slope: 0 to 8 percent
Large stones and some boulders cover 3 to 15 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.4 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils near drainageways and in concave areas
- Weikert soils on knobs and in other convex positions
- A few small areas of soils that have short, steep slopes or that are not stony
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to occasional flooding of brief duration

Similar inclusions:
- A few areas of clayey soils
- Some areas of soils where stones and boulders cover less than 3 percent of the surface
- A few areas of soils that are firm and brittle in the lower part of the subsoil

SrD—Sideling gravelly loam, 8 to 25 percent slopes, extremely stony

Typical Composition

Sideling and similar soils: 85 percent
Dissimilar inclusions: Buchanan—5 percent; Weikert—5 percent; alluvial soils—5 percent

Setting

Landform: Mountain slopes
Position on landform: Footslopes and backslopes
Slope: 8 to 25 percent
Large stones and some boulders cover from 3 to 15 percent of the surface.

Soil Properties and Qualities

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.4 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils on the more concave parts of the slope and on benches
- Weikert soils on knobs and in the more convex areas on backslopes
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- Some small areas of clayey soils
- A few areas of soils that are very firm and brittle in the lower part of the subsoil
- Areas of soils where stones and boulders cover less than 3 percent of the surface

SSF—Sideling and Hazleton soils, 25 to 60 percent slopes, extremely stony

Typical Composition

Sideling and similar soils: 45 percent
Hazleton and similar soils: 45 percent
Dissimilar inclusions: Buchanan—5 percent; Weikert—5 percent

Setting

Landform: Mountain slopes
Position on landform: Backslopes
Slope: 25 to 45 percent
Large stones and some boulders cover from 3 to 15 percent of the surface. Some areas consist mostly of Sideling soils or Hazleton soils, and some areas consist of both soils. Generally, Hazleton soils are on the more convex parts of the backslope.

Soil Properties and Qualities

Sideling

Texture of the surface layer: Gravelly loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Parent material: Colluvium derived from sandstone, siltstone, and shale
Flooding: None
Water table: Perched (2.5 to 4.0 feet)
Available water capacity: Mainly 7.4 inches

Hazleton

Texture of the surface layer: Channery sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Parent material: Residuum and soil creep derived from quartzite or sandstone
Flooding: None
Available water capacity: Mainly 6.1 inches

Inclusions

Dissimilar inclusions:
- Buchanan soils along drainageways and on benches
- Weikert soils on knobs and in the more convex areas on backslopes
- Alluvial soils that are in narrow areas along streams and drainageways and that are subject to frequent flooding of very brief duration

Similar inclusions:
- Some areas of soils where stones and boulders cover more than 15 percent of the surface

Ty—Tyler silt loam, 0 to 3 percent slopes

Typical Composition

Tyler and similar soils: 85 percent
Dissimilar inclusions: Purdy—8 percent; Brinkerton—7 percent

Setting

Landform: Terraces
Slope: 0 to 3 percent
This soil is about 5 to 30 feet above the present flood plain. Some short escarpments border flood plains adjacent to the terraces.

Soil Properties and Qualities

Texture of the surface layer: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat poorly drained
Parent material: Old alluvium derived from soils on uplands underlain by acid sandstone and shale
Flooding: None
Water table: Perched (0.5 to 2.0 feet)
Available water capacity: Mainly 8.0 inches

Inclusions

Dissimilar inclusions:
- Brinkerton soils generally in depressions on toeslopes
- Purdy soils that are in slackwater areas and in depressions and that are subject to common ponding of brief duration

Similar inclusions:
- A few areas of soils that have bedrock at a depth of less than 60 inches
- Some small areas of soils that are as much as 40 percent cobbles and gravel throughout
- A few areas of slightly acid or neutral soils
- Some areas of moderately well drained soils

Uu—Urban land-Udorthents complex, 0 to 25 percent slopes

Typical Composition

Urban land: 45 percent
Udorthents and similar soils: 45 percent
Dissimilar inclusions: Somewhat poorly drained soils—5 percent; well drained soils—5 percent

Figure 14.—An area of Weikert channery silt loam, 3 to 8 percent slopes. Although this soil is shallow to bedrock, if it is used as cropland and managed to conserve water, it produces fair yields of crops.

Setting

Urban land is covered by streets, parking lots, buildings, and other structures that obscure the soils. Udorthents are soil materials that have been subjected to earthmoving operations.

Soil Properties and Qualities

Urban land

Texture of the surface layer: Variable
Depth class: Shallow (10 to 20 inches)
Flooding: None
Available water capacity: None

Udorthents

Texture of the surface layer: Very channery loam
Flooding: None
Available water capacity: Mainly 1.5 inches

WeB—Weikert channery silt loam, 3 to 8 percent slopes

Typical Composition

Weikert and similar soils: 90 percent
Dissimilar inclusions: Ernest—5 percent; moderately well drained, moderately deep soils—5 percent; rock outcrops—5 percent

Setting

Landform: Hills
Position on landform: Summits and shoulders (fig. 14)
Slope: 3 to 8 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Parent material: Residuum derived from gray and brown, acid shale, siltstone, and fine grained sandstone
Flooding: None
Available water capacity: Mainly 1.5 inches

Inclusions

Dissimilar inclusions:
- Ernest soils in swales
- Moderately well drained, moderately deep soils in saddles on ridgetops
- Some rock outcrops on narrow ridgetops and in other convex positions

Similar inclusions:
- Some areas of soils that have more clay in the subsoil than the Weikert soil
- A few areas of soils that are sandier or redder than the Weikert soil

• Some areas of soils that have bedrock at a depth of more than 20 inches

WeC—Weikert channery silt loam, 8 to 15 percent slopes

Typical Composition

Weikert and similar soils: 90 percent
Dissimilar inclusions: Ernest—5 percent; moderately well drained, moderately deep soils—4 percent; Philo—1 percent

Setting

Landform: Hills
Position on landform: Shoulders and backslopes
Slope: 8 to 15 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Parent material: Residuum derived from gray and brown, acid shale, siltstone, and fine grained sandstone
Flooding: None
Available water capacity: Mainly 1.4 inches

Inclusions

Dissimilar inclusions:
• Ernest soils in narrow draws and in drainageways
• Moderately well drained, moderately deep or deep soils on head slopes, in swales, and in saddles
• Some areas of stony soils
• Philo soils along drainageways
• A few areas of small, wet weather springs and seeps
• Rock outcrops on some narrow ridgetops and convex backslopes
Similar inclusions:
• Some areas of soils that have more clay in the subsoil than the Weikert soil
• A few areas of soils that are sandier or redder than the Weikert soil
• Areas of soils that have bedrock at a depth of more than 20 inches

WeD—Weikert channery silt loam, 15 to 25 percent slopes

Typical Composition

Weikert and similar soils: 85 percent
Dissimilar inclusions: Ernest—5 percent; moderately well drained, moderately deep soils—7 percent; Philo—3 percent

Setting

Landform: Hills
Position on landform: Backslopes
Slope: 15 to 25 percent

Soil Properties and Qualities

Texture of the surface layer: Channery silt loam
Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Parent material: Residuum derived from gray and brown, acid shale, siltstone, and fine grained sandstone
Flooding: None
Available water capacity: Mainly 1.3 inches

Inclusions

Dissimilar inclusions:
• Ernest soils in narrow swales, on the lower backslopes, on toeslopes, and on footslopes
• Moderately well drained, moderately deep soils on concave backslopes and on head slopes
• Philo soils along drainageways
• Some areas of stony soils
• A few areas of small, wet weather springs and seeps
Similar inclusions:
• Some areas of soils that have more clay in the subsoil than the Weikert soil
• A few areas of soils that are sandier or redder than the Weikert soil
• Some areas of soils that have bedrock at a depth of more than 20 inches

WuB—Wurno-Nollville channery silt loams, 3 to 8 percent slopes

Typical Composition

Wurno and similar soils: 50 percent
Nollville and similar soils: 40 percent
Dissimilar inclusions: Shallow soils—5 percent; rock outcrops—2 percent; moderately well drained soils—3 percent

Setting

Landform: Ridges and hills
Position on landform: Summits
Slope: 3 to 8 percent
Wurno and Nollville soils are so imtermingled on the

landform that it was not practical to separate them in mapping. Wurno soils are in the more convex positions.

Soil Properties and Qualities

Wurno

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 1.9 inches

Nollville

Texture of the surface layer: Channery silt loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from thin-bedded, calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 9.2 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained, moderately deep soils on some backslopes and in swales

Similar inclusions:
- A few areas of soils that have more clay in the subsoil than the Wurno soil
- Some small areas of very strongly acid soils
- Some small areas of very deep soils
- A few areas of soils that are redder than the Nollville soil

WuC—Wurno-Nollville channery silt loams, 8 to 15 percent slopes

Typical Composition

Wurno and similar soils: 50 percent
Nollville and similar soils: 40 percent
Dissimilar inclusions: Shallow soils—4 percent; rock outcrops—1 percent; moderately well drained soils—5 percent

Setting

Landform: Ridges
Position on landform: Summits and shoulders
Slope: 8 to 15 percent
Wurno and Nollville soils are so intermingled on the landform that it was not practical to separate them in mapping. Wurno soils are on the more convex parts of the landform.

Soil Properties and Qualities

Wurno

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 1.9 inches

Nollville

Texture of the surface layer: Channery silt loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from thin-bedded, calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 9.2 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained, moderately deep soils on some backslopes and in swales

Similar inclusions:
- A few areas of soils that have more clay in the subsoil than the Wurno and Nollville soils
- Some small areas of very strongly acid soils
- Some small areas of very deep soils
- A few areas of soils that are redder than the Wurno and Nollville soils

WuD—Wurno-Nollville channery silt loams, 15 to 25 percent slopes

Typical Composition

Wurno and similar soils: 50 percent
Nollville and similar soils: 40 percent
Dissimilar inclusions: Rock outcrops—1 percent; moderately well drained soils—5 percent; soils that are shallower than the Wurno soil—4 percent

Setting

Landform: Ridges and hills
Position on Landform: Backslopes
Slope: 15 to 25 percent
Wurno and Nollville soils are so intermingled on the landform that it was not practical to separate them in mapping. Wurno soils are on the more convex parts of the landform.

Soil Properties and Qualities

Wurno

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 1.6 inches

Nollville

Texture of the surface layer: Channery silt loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from thin-bedded, calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 9.0 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained, moderately deep and deep soils on some backslopes and in swales

Similar inclusions:
- Some small areas of very deep soils
- A few areas of soils that are redder than the Wurno and Nollville soils
- A few areas of soils that have more clay in the subsoil than the Wurno and Nollville soils
- Some small areas of very strongly acid soils

WuE—Wurno-Nollville channery silt loams, 25 to 45 percent slopes

Typical Composition

Wurno and similar soils: 45 percent
Nollville and similar soils: 45 percent
Dissimilar inclusions: Shallow, clayey soils—5 percent; moderately well drained soils—5 percent

Setting

Landform: Ridges and hills
Position on landform: Backslopes
Slope: 25 to 45 percent
Wurno and Nollville soils are so intermingled on the landform that it was not practical to separate them in mapping. Wurno soils are on the more convex parts of the landform.

Soil Properties and Qualities

Wurno

Texture of the surface layer: Channery silt loam
Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Parent material: Residuum derived from calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 1.7 inches

Nollville

Texture of the surface layer: Channery silt loam
Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Parent material: Residuum derived from thin-bedded, calcareous shale and limestone
Flooding: None
Available water capacity: Mainly 8.7 inches

Inclusions

Dissimilar inclusions:
- Moderately well drained, moderately deep soils on some backslopes and in swales

Similar inclusions:
- A few areas of soils that have more clay in the subsoil
- Some small areas of very strongly acid soils
- Some small areas of very deep soils
- A few areas of soils that are redder than the Wurno and Nollville soils

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

This section suggests general management needed for crops and pasture. It lists the estimated yields of the main crops and pasture plants for each soil. It explains the system of land capability classification used by the Natural Resources Conservation Service. It also describes prime farmland.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Farming is a major land use in Fulton County. In 1994 the land in farms comprised 96,500 acres, or 35 percent of the county. The 500 farms in the county had an average size of 193 acres. Total harvested field and forage crops amounted to 37,433 acres. The farms were classified as follows: 95 dairy farms; 70 hog farms; 50 poultry farms; 15 sheep farms; and 270 field crop and other farms. In 1994, the reported yields were as follows: 12,400 acres of corn for grain and silage, 2,700 acres of oats, 1,700 acres of wheat, and 23,000 acres of alfalfa and other hay. The rest of the farmland was in pasture, in idle cropland, or in other use. Most crops are fed to livestock on the farms; the livestock is marketed as beef, dairy products, and poultry. The southeastern part of the county has a few orchards.

Soil erosion is the major soil management problem on most cropland and pasture in Fulton County. Hagerstown, Murrill, and Nollville soils are among the most productive in the county, but are highly susceptible to erosion. On these and other soils, conservation practices help to control erosion.

Loss of topsoil through erosion reduces the productivity of soils, especially on shallow or moderately deep soils, soils that have a fragipan, and soils that have a low available water capacity. Ernest, Laidig, and Monongahela soils, for example, have a fragipan. Moderately deep Berks and Calvin soils have a low available water capacity.

Many sloping channery soils have many rock fragments, which erosion has exposed at the surface. On these soils seedbed preparation and tillage are difficult. An example of these soils is Weikert channery silt loam, 8 to 15 percent slopes.

Erosion control practices establish or maintain a protective surface cover, reduce runoff and

sedimentation, and increase water infiltration. Maintaining vegetative cover helps to increase soil productivity. On pasture and hayland, rotational grazing and using grasses and legumes in the cropping system help to reduce erosion, to provide nitrogen, and to improve soil quality. Contour farming, conservation tillage, cover crops, no-till farming, and crop residue management help to increase water infiltration and to control erosion.

Diversions reduce the length of slopes and help to reduce runoff and to control erosion. They are most practical on deep, well drained soils that have moderate, uniform slopes. Soils that have steep or irregular slopes, excessive wetness, or a clayey subsoil or are shallow to bedrock are less suitable for diversions. Most soils in Fulton County have irregular slopes and are generally not suitable for cropland terraces.

Contour farming and stripcropping are other erosion control practices commonly used in the survey area. They are especially applicable on soils that have uniform slopes, such as Murrill gravelly loam, 8 to 15 percent slopes.

Soil drainage is a major management need on many soils in Fulton County. Some soils are so wet that crop production is not practical or economically feasible unless artificial drainage is installed. Andover and Brinkerton soils, for example, are poorly drained.

The somewhat poorly drained soils in the county are so wet that crops are damaged in most years unless artificial drainage is provided. Penlaw and Tyler soils, for example, are somewhat poorly drained.

Small areas of wet soils are in drainageways and swales. These soils generally are mapped as inclusions in map units of moderately well drained Hustontown and Ernest soils. Artificial drainage can improve the productivity of these soils, and also can help to reduce the potential for gully erosion.

The design of surface and subsurface drainage systems varies with the kind of soil. A combination of surface and tile drainage generally is needed on poorly drained soils that are intensively cropped. Tile drains must be more closely spaced in soils that have slow permeability than in those that have quicker permeability. Clarksburg and Buchanan soils, for example, have slow or moderately slow permeability. Locating adequate outlets for a tile drainage system generally is difficult.

Soil fertility is naturally low in many soils in the survey area. Many upland soils are naturally strongly acid and require applications of lime to supply calcium and to raise the pH sufficiently for good growth of alfalfa and other crops. The content of available phosphorus and magnesium is naturally low in most soils. For all soils, lime and fertilizer should be applied on the basis of soil tests. The Cooperative Extension Service can help to determine the kind and amount of fertilizer and lime to apply.

Soil tilth is an important factor in seed germination, plant growth, and water infiltration. Soils that have good soil condition are granular and porous. Pope soils, for example, have good soil condition.

Many cropland soils in the survey area have a relatively low organic matter content. Generally, the structure of the surface layer of such soils is weak, and intensive rainfall generally results in surface crusting. The crust generally is hard and nearly impervious to water when the soil is dry, and generally reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material help to improve soil structure and to reduce crust formation. The use of no-till systems will help to decrease crusting and to improve surface structure.

Generally, fall plowing is not considered to be a good practice on soils that have a surface layer of silt loam that is low in organic matter content. Fall plowing commonly results in the formation of a crust in winter and spring, and many soils are nearly as dense and hard at planting time after fall plowing as before plowing. Also, sloping soils are subject to accelerated erosion if plowed in fall.

Special crops produced in the survey area are tree fruits, such as apples and peaches; vegetables; and nursery plants. Soils that are deep, that have good natural drainage, and that warm up early in spring are best suited to special crops, such as tree fruits. Good air drainage is needed to reduce frost damage to apples and peaches.

The latest information on growing specialty crops is available at the local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil

and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 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, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of the map units in this survey area is given in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities,

growing season, and moisture supply are those needed for the economic production of sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 27,614 acres in the survey area, or nearly 10 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, but most are in the southern part, mainly in associations 2, 3, and 6, which are described under the heading "General Soil Map Units." Most of this prime farmland is used for crops. The crops grown on this land are mainly corn and hay.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Forestland Management and Productivity

B.A. McWhorter, forester, Natural Resources Conservation Service, and Mark Deibler, Bureau of Forestry, Pennsylvania Department of Conservation and Natural Resources, helped to prepare this section.

Fulton County has about 193,400 acres of forest land, which takes in 69 percent of the total land area in the county. Of the 190,300 acres of commercial forest land in the county, 144,400 acres is privately owned and 45,900 acres is publicly owned. About 3,100 acres of the forest land is noncommercial.

The original forest of Fulton County consisted mainly of mixed oak, American chestnut, pine, and hemlock (American Foresters, 1954). Pitch pine was a predominant species on the drier, shallow soils, especially on ridgetops. These original stands were removed during the lumbering boom of the late 1800's and early 1900's. American chestnut suffered from fungal blight imported into this country in 1904. Blight spread through the forest and killed all American chestnut trees in its path. It removed American chestnut as an important component of forests. American chestnut fungus does not infect the roots, and many original stumps continue to sprout, only to be reinfected and die. American chestnut possibly will become resistant to fungal blight and can again become a part of Fulton County's forests.

Today's predominantly oak forest resulted from extensive, excessive logging and other abuses of the original stands because of a general lack of good woodland management practices. Uncontrolled, destructive fires followed the removal of the original trees. The American chestnut has disappeared, and the ensuing "pure" oak stands have provided favorable conditions for attacks from insects or diseases. The gypsy moth and other insects have defoliated and caused trees to die in large areas, especially on ridges.

Fulton County's current forest consists of second, third, and even fourth growth trees. The dominant species on the ridges is oak. In the intermountain valleys the forest cover is predominantly mixed-hardwood and Virginia pine. Old fields and other abandoned farmland have naturally converted to Virginia pine. Mixed hardwoods replaced Virginia pine as it was harvested or as it deteriorated.

The principal forest types that make up the present forest land in the county and the extent of each have been documented by the U.S. Forest Service (USDA, 1978 and 1989). Softwoods cover 11,100 acres of commercial forest land in the county. This type consists of the white pine and hemlock group and the Scotch and Virginia pine group. Common associates of the white pine and hemlock group are red maple, red oak, white oak, beech, black cherry, and aspen. Common associates of the Scotch and Virginia pine group are pitch pine, eastern red cedar, white pine, oak, yellow-poplar, and white ash.

The oak group takes in 163,700 acres of commercial forest land. This group consists of the oak/pine, oak/hickory, and oak/gum groups. Common

associates include red maple, black cherry, and hickory.

The northern hardwood group makes up the remaining 15,500 acres of commercial forest land in Fulton County. This group consists of sugar maple, beech, and yellow birch. Common associates are red maple, sweet birch, black cherry, white ash, northern red oak, basswood, aspen, white oak, hickory, hemlock, and white pine.

Sawtimber makes up about 109,800 acres of commercial forest land, while poletimber comprises about 58,400 acres. The remaining 22,100 acres are in seedling and sapling stands and in stands classified as less than 10 percent stocked with growing stock trees.

In general, the soils in the county are capable of supporting good stands of red oak, sugar maple, yellow-poplar, and white pine. Trees grow better on the deeper, well drained soils than on the shallow, poorly drained soils.

To encourage the growth of desirable trees, forest landowners can use proper forest management practices in areas where the soils are rated with an upland oak site index of 68 or greater. Site index is a measure of site quality based on the average height in feet of the dominant and codominant commercial species at 50 years of age. A professional forester can provide assistance to landowners interested in developing and implementing a forest management plan.

Soils rated with an upland oak site index of 40-67 are more difficult to manage. A thorough inventory of quantity and quality of growing stock onsite is needed. The market potential for the species present and soils ratings in the area should be taken into consideration when determining if management inputs are economically feasible.

Besides income from forest products, forest land in Fulton County can also provide woodland owners with watershed protection, wildlife habitat, and recreational and aesthetic opportunities. The better sites can provide profit and pleasure to the landowner if properly managed and protected from fire, disease, insects, and livestock grazing.

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 symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In the table, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for

seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as numbers for *site index* and *volume of wood fiber*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Volume of wood fiber, is the yield, in cubic feet per acre per year, likely to be produced by the most important trees. This yield indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The species that is followed by an asterisk under *common trees* is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to manage are those that are suitable for commercial wood production.

Recreation

Fulton County has abundant recreational activities. Annually, they attract tourists and residents alike and provide an important source of revenue. Among the major recreation facilities are Cowans Gap State Park and Meadow Grounds Lake. Although most woodland and most land bordering streams are privately owned, a large acreage is publicly owned or controlled. The Pennsylvania Game Commission manages about 18,608 acres of public land, and has landowner agreements on about 49,000 acres of private land. The Pennsylvania Bureau of Forestry manages about 30,127 acres. The county also has about 857 acres of State parks. The diverse landscape, which comprises lakes, streams, and woodland, provides opportunities for hunting, camping, horseback riding, fishing, hiking, canoeing, boating, and nature study. Vacation homes, church camps, and summer camps bring many visitors to Fulton County.

The best soils in the county for most recreation uses are deep, well drained soils that have few or no stones on the surface. However, many soils in the county are extremely stony, and are severely limited for intensive recreation use. However, these soils have potential for recreation uses that require only slight land alteration, such as hiking trails. The soils that have the poorest potential for recreation use are poorly drained and very poorly drained or steep and very steep.

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. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines.

The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, it is essential to do an onsite assessment of the height, duration, intensity, and frequency of flooding.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 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 and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

The principal game species in Fulton County are white-tailed deer, squirrel, cottontail, ruffed grouse, ringnecked pheasant, and wild turkey. Furbearers, which are abundant, are beaver, mink, muskrat, raccoon, and fox. Various nongame species, including songbirds, reptiles, amphibians, and small mammals, also inhabit the county.

The occurrence and abundance of wildlife species are related to land use, which, in turn, is closely correlated to soil patterns. Soils capable of producing good growth of plants favored by wildlife can sustain a good population of wildlife. Nonsoil factors, such as the availability of water, the weather, predators, diseases, and human activities, are also important factors. They help determine whether a particular species of wildlife can survive or thrive in a particular area.

White-tailed deer inhabit all areas of the county, especially woodland that has mixed brush or young trees, a few mature trees, and some small, open areas. Many deer seek the protection of forests, but prefer to feed on farm crops. Ruffed grouse inhabit both woodland areas and field edges.

Ringnecked pheasant, dove, and cottontail rabbit are plentiful in areas that have been farmed. Abandoned farmland overgrown by brush generally supports large populations of cottontail rabbit.

Gray squirrel and wild turkey prefer mature woodland. Squirrel mainly inhabits mature, nut-producing oak-hickory woodland.

Raccoon, opossum, groundhog, skunk, and fox are generally well distributed throughout the county. Beaver, mink, and muskrat inhabit streams and ponds on bottom land.

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.

Elements of Wildlife Habitat

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem and goldenrod.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and huckleberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Habitat for Various Kinds of Wildlife

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, 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, 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

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 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 depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without

basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high

content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of groundwater pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 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; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that

impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 14.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 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 the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 14.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by

converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing sieve number is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, greater than 9 percent.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed

as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K indicates the erodibility of the whole soil. The presence of rock fragments modify the estimates.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Soil and Water Features

Tables 16 and 17 give estimates of various soil features and water features, respectively. The estimates are used in land use planning that involves engineering considerations.

In table 16, *depth to bedrock* is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

In table 17, *Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table and ponding (seasonal) are the highest level of a saturated zone in the soil or ponding in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched, apparent, or artesian; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

For *ponding*, table 17 gives *Ponding duration* and *Maximum ponding depth.*

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin et al., 1979; Environmental Laboratory, U.S. Army Corps of Engineers, 1987;

National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1975) and "Keys to Soil Taxonomy" (USDA, 1992) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (USDA, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

This survey can be used to locate probable areas of hydric soils.

The map units in table 18 have at least one component that meets the definition of hydric soils and that has at least one hydric soil indicator. This list can help in planning land use; however, onsite investigation is recommended to determine the hydric soils on a specific site (USDA, 1996).

Map units made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions of the landform. Map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions of the landform.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is Hagerstown soils.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975) and in "Keys to Soil Taxonomy" (USDA, 1992). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allegheny Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Terraces
Parent material: Old alluvium washed from uplands underlain by acid shale, siltstone, and sandstone
Slope range: 3 to 8 percent
Associated soils: Monongahela, Tyler, Pope, and Philo

Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludults

Typical Pedon

Allegheny loam, 3 to 8 percent slopes, in Antrim Township, Franklin County, 2 miles east of Williamson, 3,800 feet west of intersection of Pennsylvania Route 3013 and Pennsylvania Township Route T433, about 150 feet north of Route T433; USGS Williamson topographic quadrangle; lat. 39 degrees 50 minutes 48 seconds N. and long. 77 degrees 46 minutes 11 seconds W.

Ap—0 to 8 inches; brown to dark brown (10YR 4/3) loam; weak very fine granular structure; very friable; nonsticky and nonplastic; 5 percent rounded sandstone pebbles; slightly acid; abrupt smooth boundary.

Bt1—8 to 25 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; 5 percent rounded sandstone pebbles; strongly acid; clear wavy boundary.

Bt2—25 to 34 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; 10 percent rounded sandstone pebbles; very strongly acid; gradual wavy boundary.

BC—34 to 42 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; firm, nonsticky and nonplastic; 10 percent rounded sandstone pebbles; very strongly acid; gradual wavy boundary.

C—42 to 65 inches; strong brown (7.5YR 5/6) gravelly loam; massive; firm, nonsticky and nonplastic; 15 percent rounded sandstone pebbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 30 to 50 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: 0 to 25 percent
Kind of rock fragments: Sandstone, siltstone, and shale
Reaction: In unlimed areas strongly acid to extremely acid

Ap horizon:
Hue—7.5YR to 10YR; value—4 or 5; chroma—2 to 4
Texture of the fine earth fraction—loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Hue—7.5YR to 2.5Y; value—4 or 5; chroma—3 to 8
Texture of the fine earth fraction—silt loam, clay loam, loam, or silty clay loam
Content of rock fragments—5 to 30 percent

BC horizon:
Hue—7.5YR to 10YR; value—3 to 6; chroma—3 to 8
Texture of the fine earth fraction—loam, clay loam, sandy clay loam, or fine sandy loam
Content of rock fragments—10 to 30 percent

C horizon:
Hue—7.5YR to 10YR; value—4 to 6; chroma—3 to 8
Texture of the fine earth fraction—loam, clay loam, or fine sandy loam
Content of rock fragments—5 to 30 percent

Andover Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Poorly drained
Landform: Base of mountain slopes
Position on the landform: Depressions, benches, swales, drainageways, and concave toeslopes
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Slope range: 0 to 8 percent
Associated soils: Laidig, Sideling, Buchanan, Dekalb, Hazleton, and Murrill
Taxonomic class: Fine-loamy, mixed, mesic Typic Fragiaquults

Typical Pedon

Andover gravelly loam, 3 to 8 percent slopes, in Fannett Township, Franklin County, 2.75 miles northeast of Amberson, 1.2 miles northeast of intersection of Pennsylvania Township Route T591 and Pennsylvania Route 4005, about 700 feet south of Route 4005; USGS Doylesburg topographic quadrangle; lat. 40 degrees 11 minutes 48 seconds N. and long. 77 degrees 38 minutes 34 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, light yellowish brown (10YR 6/4) dry; weak fine platy structure; friable, slightly sticky and slightly plastic; many very fine to coarse roots; few fine distinct light gray to gray (10YR 6/1) iron depletions and few fine prominent yellowish brown (10YR 5/8) iron concentrations; 15 percent

subangular sandstone gravel; very strongly acid; abrupt smooth boundary.

Btg1—8 to 14 inches; gray (10YR 5/1) gravelly loam; weak fine and medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine to medium roots; common faint clay films on faces of peds and in pores; common medium faint light gray to gray (10YR 6/1) and very dark grayish brown (10YR 3/2) iron depletions and few fine prominent yellowish brown (10YR 5/8) iron concentrations; 15 percent subangular sandstone gravel; very strongly acid; clear smooth boundary.

Btg2—14 to 19 inches; grayish brown (10YR 5/2) gravelly clay loam; moderate fine and medium subangular blocky structure; firm, slightly sticky and slightly plastic; common faint light brownish gray (10YR 6/2) clay films on faces of peds and in pores; many coarse prominent yellowish brown (10YR 5/8) and light yellowish brown (10YR 6/4) iron concentrations; 15 percent subangular sandstone gravel; very strongly acid; clear wavy boundary.

Btxg—19 to 46 inches; grayish brown (10YR 5/2) gravelly clay loam; moderate very coarse prismatic structure parting to weak medium platy; very firm, brittle, slightly sticky and slightly plastic; few faint light brownish gray (10YR 6/2) clay films on faces of peds; few prominent black (N 2/) concretions; many coarse prominent strong brown (7.5YR 5/6) iron concentrations; many coarse prominent gray (10YR 6/1) iron depletions; 20 percent subangular sandstone gravel; very strongly acid; gradual wavy boundary.

Cg—46 to 65 inches; brown (7.5YR 5/2) gravelly sandy loam; weak coarse prismatic structure; firm, slightly sticky and slightly plastic; common medium prominent light gray (N 7/) iron depletions; common medium prominent dark yellowish brown (10YR 4/4) pore linings; 25 percent subangular sandstone gravel; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 72 inches
Depth to a fragipan: 18 to 28 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: 15 to 34 percent
Size of rock fragments: Gravel to stones
Kind of rock fragments: Sandstone, siltstone, and shale
Reaction: In unlimed areas very strongly acid or strongly acid

A horizon:
Hue—10YR; value—2 to 4; chroma—1 to 6
The horizon has redoximorphic features.
Texture of the fine earth fraction—loam
Content of rock fragments—15 to 40 percent

E horizon (if it occurs):
Hue—10YR; value—2 to 5; chroma—1 to 6
The horizon has redoximorphic features.
Texture of the fine earth fraction—silt loam, loam, or silty clay loam
Content of rock fragments—5 to 40 percent

B horizon:
Hue—10YR; value—4 to 6; chroma—1 or 2
The horizon has redoximorphic features.
Texture of the fine earth fraction—loam, clay loam, or sandy clay loam
Content of rock fragments—10 to 30 percent

Btx horizon:
Hue—10YR; value—4 or 5; chroma—1 to 8
The horizon has redoximorphic features.
Texture of the fine earth fraction—sandy clay loam, loam, or clay loam
Content of rock fragments—15 to 40 percent in the individual subhorizons

C horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—1 to 4
The horizon has redoximorphic features.
Texture of the fine earth fraction—sandy loam to clay loam
Content of rock fragments—15 to 50 percent

Atkins Series

Depth to bedrock: Very deep
Drainage class: Poorly drained
Landform: Flood plains
Parent material: Stratified alluvium washed from uplands underlain by acid shale, siltstone, and sandstone
Slope range: 0 to 3 percent
Associated soils: Pope, Basher, Philo, Ernest, Brinkerton, Barbour, Berks, and Weikert
Taxonomic class: Fine-loamy, mixed, acid, mesic Typic Fluvaquents

Typical Pedon

Atkins silt loam, in Dublin Township, Fulton County, 1.5 miles northeast of Mellots Mill, 500 feet east of bridge on Pennsylvania Township Route T422 over Licking Creek, 80 feet south of Licking Creek; USGS

Hustontown topographic quadrangle; lat. 40 degrees 1 minute 28 seconds N. and long. 78 degrees 0 minutes 50 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 2 percent rounded sandstone and siltstone pebbles; strongly acid; clear wavy boundary.

Bg1—4 to 20 inches; gray (10YR 6/1) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine faint dark grayish brown (10YR 4/2) iron depletions along faces of peds and few fine distinct strong brown (7.5YR 5/8) iron concentrations; 2 percent rounded sandstone and siltstone pebbles; strongly acid; gradual wavy boundary.

Bg2—20 to 26 inches; light gray (10YR 7/1) silt loam; weak medium subangular blocky structure; friable, sticky and plastic; few fine roots; many fine distinct grayish brown (10YR 5/2) iron depletions along faces of peds and yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) iron concentrations; 2 percent rounded sandstone and siltstone pebbles; very strongly acid; gradual wavy boundary.

Bg3—26 to 36 inches; light gray (10YR 7/1) silty clay loam; weak medium subangular blocky structure; friable, sticky and plastic; many fine distinct grayish brown (10YR 5/2) iron depletions along faces of peds and many medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) iron concentrations; 2 percent rounded sandstone and siltstone pebbles; very strongly acid; gradual wavy boundary.

Cg—36 to 50 inches; light brownish gray (10YR 6/2) loam; massive structure; friable, slightly sticky and slightly plastic; many medium prominent gray (N 6/) iron depletions along ped surfaces and common medium prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) iron concentrations; 10 percent rounded sandstone and siltstone pebbles; very strongly acid; gradual wavy boundary.

2Cg—50 to 70 inches; light gray (10YR 7/1) stratified gravelly silt loam to gravelly sandy loam; massive to single grain; friable, nonsticky to slightly sticky and nonplastic; common medium prominent brownish yellow (10YR 6/6) iron concentrations; 30 percent rounded sandstone and siltstone pebbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 25 to 50 inches
Depth to bedrock: More than 60 inches
Organic matter content: Decreases irregularly with depth
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: 0 to 25 percent
Kind of rock fragments: Sandstone, siltstone, or shale
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—10YR; value—4 to 7; chroma—1 or 2
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

Bg horizon:
Hue—7.5YR, 10YR, or neutral; value—4 to 7; chroma—1 or 2
The horizon has redoximorphic features.
Texture of the fine earth fraction—silt loam, silty clay loam, or loam
Content of rock fragments—0 to 20 percent

Cg horizon:
Hue—7.5YR to 10YR; value—4 to 7; chroma—0 to 8
The horizon has redoximorphic features.
Texture of the fine earth fraction—loam, silt loam, or sandy loam
In some pedons sand and gravel is below a depth of 36 inches.
Content of rock fragments—0 to 60 percent

Barbour Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Flood plains
Parent material: Alluvium washed from uplands underlain by acid, reddish sandstone, siltstone, and shale
Slope range: 0 to 3 percent
Associated soils: Basher, Atkins, Calvin, Klinesville, and Hustontown
Taxonomic class: Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrochrepts

Typical Pedon

Barbour fine sandy loam, in Fulton County, Union Township, 1,000 feet northwest of intersection of Pennsylvania Route 8006 and Pennsylvania Route 3007; about 30 feet east of Little Tonoloway Creek; USGS Needmore topographic quadrangle; lat. 39

degrees 48 minutes 4 seconds N. and long. 78 degrees 14 minutes 54 seconds W.

Ap—0 to 6 inches; dark reddish brown (5YR 3/4) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; strongly acid; clear smooth boundary.
Bw1—6 to 22 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots; strongly acid; gradual wavy boundary.
Bw2—22 to 35 inches; reddish brown (5YR 4/4) fine sandy loam; very weak medium and coarse subangular blocky structure; friable, nonsticky and nonplastic; few fine roots; 5 percent pebbles and cobbles; very strongly acid; gradual wavy boundary.
2C—35 to 65 inches; brown (7.5YR 4/4) stratified loamy sand and gravelly sand; single grain; loose, nonsticky and nonplastic; very few fine roots; 30 percent pebbles and cobbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: 10 to 18 percent
Content of rock fragments in the control section: 0 to 25 percent
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—5YR or 7.5YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—fine sandy loam
Content of rock fragments—0 to 15 percent

Bw horizon:
Hue—5YR or 7.5YR; value—3 to 5; chroma—3 to 6
Texture of the fine earth fraction—loam, fine sandy loam, or silt loam
Content of rock fragments—0 to 30 percent

2C horizon:
Hue—5YR or 7.5YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—loamy sand, sand, or loamy fine sand
Content of rock fragments—20 to 50 percent

Basher Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Flood plains
Parent material: Alluvium washed from uplands underlain by red shale, siltstone, and sandstone
Slope range: 0 to 3 percent
Associated soils: Barbour, Atkins, Calvin, Klinesville, Leck Kill, and Hustontown
Taxonomic class: Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts

Typical Pedon

Basher fine sandy loam, in Wells Township, Fulton County, 0.8 mile south of Enid, 0.55 mile east of intersection of Pennsylvania Township Route T441 and Pennsylvania Route 4013; USGS Hustontown topographic quadrangle; lat. 40 degrees 5 minutes 18 seconds N. and long. 78 degrees 6 minutes 53 seconds W.

Ap—0 to 8 inches; reddish brown (5YR 4/3) fine sandy loam; moderate medium granular structure; friable, nonsticky and nonplastic; many very fine and fine roots; moderately acid; clear wavy boundary.
Bw—8 to 14 inches; reddish brown (5YR 4/4) loam; weak fine and medium subangular blocky structure; friable, nonsticky and nonplastic; common very fine and fine roots; strongly acid; gradual wavy boundary.
BC—14 to 22 inches; reddish brown (5YR 5/4) loam; very weak coarse subangular blocky structure; very friable, nonsticky and nonplastic; few very fine and fine roots; strongly acid; gradual wavy boundary.
C1—22 to 34 inches; variegated reddish brown (5YR 5/4) and yellowish red (5YR 5/6) sandy loam; single grain; very friable, nonsticky and nonplastic; common medium distinct reddish gray (5YR 5/2) iron depletions lining channels; strongly acid; gradual wavy boundary.
C2—34 to 46 inches; reddish brown (5YR 5/3) loam; massive; friable, nonsticky and nonplastic; many medium faint reddish gray (5YR 5/2) iron depletions lining channels and common medium prominent yellowish red (5YR 5/6) iron concentrations; strongly acid; clear wavy boundary.
Cg—46 to 65 inches; gray (5YR 5/1) gravelly sandy loam; single grain; very friable, nonsticky and nonplastic; many medium prominent light brown (7.5YR 6/4) iron depletions lining pores and channels and common medium prominent reddish

yellow (7.5YR 7/6) iron concentrations; 15 percent pebbles; strongly acid.

Range in Characteristics

Thickness of the solum: 16 to 40 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: 6 to 18 percent
Content of rock fragments in the control section: 0 to 20 percent
Kind of rock fragments: Sandstone, siltstone, or shale
Reaction: In unlimed areas strongly acid to slightly acid

A horizon:
Hue—5YR or 7.5YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—fine sandy loam
Content of rock fragments—0 to 15 percent

Bw horizon:
Hue—2.5YR or 5YR; value—3 to 5; chroma—3 to 6
In some pedons the horizon has redoximorphic features.
Texture of the fine earth fraction—loam, silt loam, or sandy loam
Content of rock fragments—0 to 20 percent

BC horizon:
Hue—5YR to 10YR; value—3 to 5; chroma—3 or 4
In some pedons the horizon has redoximorphic features.
Texture of the fine earth fraction—loam, silt loam, or sandy loam
Content of rock fragments—0 to 20 percent

C horizon:
Hue—5YR to 10YR; value—3 to 5; chroma—1 to 4
Texture of the fine earth fraction—loam to loamy sand
Content of rock fragments—10 to 60 percent
The horizon has redoximorphic features.

Bedington Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Hills and ridges
Position on landform: Summits and backslopes
Parent material: Gray, yellowish-brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Slope range: 3 to 25 percent
Associated soils: Weikert, Berks, Ernest, Brinkerton, Philo, Pope, and Atkins
Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludults

Typical Pedon

Bedington channery silt loam, 3 to 8 percent slopes, in Lurgan Township, Franklin County, 1 mile west of Orrstown, 2,000 feet south of intersection of Pennsylvania Route 0433 and Pennsylvania Township Route T635, about 1,200 feet southeast of T635; USGS Roxbury topographic quadrangle; lat. 40 degrees 3 minutes 40 seconds N. and long. 77 degrees 37 minutes 48 seconds W.

Ap—0 to 8 inches; brown to dark brown (10YR 4/3) channery silt loam; weak fine and medium granular structure; friable, nonsticky, nonplastic; many fine roots; 15 percent angular shale channers; slightly acid; clear smooth boundary.
Bt1—8 to 25 inches; strong brown (7.5YR 5/6) channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky, nonplastic; common fine roots; common distinct clay films on faces of peds and in pores; 20 percent angular shale channers; moderately acid; clear wavy boundary.
Bt2—25 to 52 inches; yellowish red (5YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; few distinct clay films on faces of peds and in pores; 25 percent angular shale channers; strongly acid; gradual wavy boundary.
C—52 to 65 inches; brown (7.5YR 5/4) very channery silt loam; common fine prominent lithochromic white 5YR 8/1 mottles; massive; firm, nonsticky, nonplastic; 50 percent angular shale channers; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Shale, sandstone, and siltstone
Reaction: In unlimed areas strongly acid or very strongly acid

Ap horizon:
Hue—10YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

BE horizon (if it occurs):
Hue—7.5YR or 10YR; value—4 to 6; chroma—5 or 6
Texture of the fine earth fraction—silt loam or loam

Content of rock fragments—15 to 35 percent

Bt horizon:
Hue—5YR to 10YR; value—5 or 6; chroma—5 or 6
Texture of the fine earth fraction—silt loam, silty clay loam, or loam
Content of rock fragments—10 to 35 percent in the upper part of the solum and 20 to 65 percent in individual horizons in the lower part of the solum

C horizon:
Hue—5YR to 10YR; value—4 or 5; chroma—4 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—50 to 80 percent

Berks Series

Depth to bedrock: Moderately deep
Drainage class: Well drained
Landform: Hills and ridges
Position on landform: Summits, shoulders, and backslopes
Parent material: Gray, yellowish brown, and olive acid shale and siltstone interbedded, in some places, with fine grained sandstone
Slope range: 3 to 25 percent
Associated soils: Weikert, Bedington, Klinesville, Calvin, Ernest, Brinkerton, Atkins, Hazleton, Pope, and Philo
Taxonomic class: Loamy-skeletal, mixed, mesic Typic Dystrochrepts

Typical Pedon

Berks channery silt loam, 8 to 15 percent slopes, Licking Creek Township, Fulton County, 0.55 mile west of Green Hill, 2,400 feet west of intersection of Pennsylvania Township Routes T398 and T410, about 200 feet north of T398; USGS Meadow Grounds topographic quadrangle; lat. 39 degrees 58 minutes 26 seconds N. and long. 78 degrees 5 minutes 50 seconds W.

Ap—0 to 8 inches; dark brown (10YR 4/3) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 25 percent angular shale rock fragments; slightly acid; abrupt smooth boundary.
Bw1—8 to 14 inches; brown (7.5YR 5/4) very channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky and nonplastic; many medium roots; 40 percent angular shale rock fragments; strongly acid; gradual wavy boundary.
Bw2—14 to 26 inches; yellowish brown (10YR 5/4) very channery loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; common fine roots; 50 percent angular shale rock fragments; strongly acid; gradual irregular boundary.
C—26 to 36 inches; yellowish brown (10YR 5/6) extremely channery loam; massive; friable, nonsticky and nonplastic; few roots; 70 percent angular shale rock fragments; very strongly acid; clear irregular boundary.
R—36 inches; light olive brown (2.5Y 5/6) and dark grayish brown (10YR 4/2) fractured shale bedrock with more than 4 inches between fractures and with an inclination of more than 30 degrees; few distinct clay and silt bridgings between rock fragments.

Range in Characteristics

Thickness of the solum: 12 to 40 inches
Depth to bedrock: 20 to 40 inches
Content of clay in the control section: 5 to 25 percent
Content of rock fragments in the control section: More than 35 percent
Kind of rock fragments: Shale, sandstone, and siltstone
Reaction: In unlimed areas extremely acid to moderately acid

A horizon:
Hue—10YR; value—3 to 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

Bw horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—15 to 75 percent in individual horizons

C horizon:
Hue—7.5YR to 2.5Y; value—4 to 6; chroma—2 to 8
Texture of the fine earth fraction—loam or silt loam
Content of rock fragments—35 to 90 percent

Brinkerton Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Poorly drained
Landform: Base of hills and benches of ridges
Position on landform: In depressions, along heads of drainageways, and on toeslopes
Parent material: Colluvium derived from acid, gray shale, siltstone, and sandstone
Slope range: 0 to 8 percent

Associated soils: Buchanan, Ernest, Berks, Weikert, Bedington, Atkins, Hustontown, and Philo
Taxonomic class: Fine-silty, mixed, mesic Typic Fragiaqualfs

Typical Pedon

Brinkerton silt loam, 0 to 3 percent slopes, in Letterkenny Township, Franklin County, 3.5 miles southwest of Upper Strasburg on Letterkenny Army Depot; USGS Roxbury topographic quadrangle; lat. 40 degrees 1 minute 2 seconds N. and long. 77 degrees 43 minutes 7 seconds W.

Ap—0 to 9 inches; dark grayish brown (2.5Y 4/2) silt loam, light yellowish brown (2.5Y 6/4) dry; moderate medium granular structure; friable, slightly sticky and slightly plastic; 5 percent subangular sandstone and shale channers; many fine roots; slightly acid; clear wavy boundary.

Btg1—9 to 13 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common fine roots; few distinct light brownish gray (10YR 6/2) clay films on faces of peds; many fine prominent light olive brown (2.5Y 5/6) iron depletions along faces of peds and root channels and yellowish brown (10YR 5/6) iron concentrations; moderately acid; clear smooth boundary.

Btg2—13 to 18 inches; gray (10YR 6/1) silty clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few fine roots; few faint light brownish gray (10YR 6/2) clay films on faces of peds; few fine distinct light brownish gray (2.5Y 6/2) iron depletions along faces of peds and root channels and few fine prominent reddish brown (5YR 4/3) iron concentrations; moderately acid; clear wavy boundary.

Btxg1—18 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam; weak very coarse prismatic structure parting to strong medium blocky structure; firm, brittle, sticky and slightly plastic; few fine roots; few faint light brownish gray (10YR 6/2) clay films on faces of peds; common fine prominent brownish yellow (10YR 6/6) iron concentrations; 5 percent subangular shale and sandstone channers; moderately acid; clear wavy boundary.

Btxg2—36 to 46 inches; gray (5Y 5/1) silty clay loam; weak very coarse prismatic structure parting to strong medium blocky structure; firm, brittle, slightly sticky and slightly plastic; many distinct light brownish gray (10YR 6/2) clay films on faces of peds; common fine prominent brownish yellow (10YR 6/8) iron concentrations; 10 percent subangular shale and sandstone channers; moderately acid; clear wavy boundary.

Cg—46 to 65 inches; gray (10YR 5/1) channery silt loam; massive; firm, slightly sticky and slightly plastic; common fine prominent olive yellow (2.5Y 6/8) iron concentrations; 40 percent subangular shale and channers; slightly acid; clear smooth boundary.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 15 to 30 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: 10 percent or less
Kind of rock fragments: Shale, sandstone, and siltstone
Reaction: In unlimed areas very strongly acid to moderately acid in the solum and strongly acid to slightly acid in the substratum

A horizon:
Hue—neutral, or hue of 10YR to 2.5Y; value—3 to 6; chroma—0 to 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 10 percent

Btg horizon:
Hue—10YR or 2.5Y; value—4 to 6; chroma—1 or 2
The horizon has redoximorphic features.
Texture of the fine earth fraction—silty clay loam or silt loam
Content of rock fragments—0 to 10 percent

Btxg horizon:
Hue—10YR or 2.5Y; value—5 or 6; chroma—0 to 3
The horizon has redoximorphic features.
Texture of the fine earth fraction—silty clay loam, silty clay, loam, or silt loam
Content of rock fragments—5 to 30 percent

Cg horizon:
Hue—10YR, 2.5Y, or neutral; value—4 to 6; chroma—0 to 4
The horizon has redoximorphic features.
Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—15 to 60 percent

Buchanan Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Moderately well drained

Landform: Mountain slopes and benches
Position on landform: Toeslopes and footslopes
Parent material: Colluvium derived from acid sandstone, siltstone, and shale
Slope range: 0 to 25 percent
Associated soils: Laidig, Sideling, Andover, Dekalb, Hazleton, Berks, Bedington, Weikert, Murrill, and Cedarcreek
Taxonomic class: Fine-loamy, mixed, mesic Aquic Fragiudults

Typical Pedon

Buchanan cobbly loam, 0 to 8 percent slopes, extremely stony, in Peters Township, Franklin County, 1.5 miles east of Fort Loudon, 4,000 feet north of intersection of U.S. Route 30 and Pennsylvania Township Route T410; USGS McConnellsburg topographic quadrangle; lat. 39 degrees 54 minutes 59 seconds N. and long. 77 degrees 52 minutes 36 seconds W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) cobbly loam; moderate fine granular structure; friable, nonsticky and nonplastic; medium fine and medium roots; 20 percent subangular sandstone cobbles and gravel; very strongly acid; clear smooth boundary.

E—2 to 7 inches; light yellowish brown (10YR 6/4) gravelly loam; moderate fine subangular blocky structure; friable, nonsticky and nonplastic; 15 percent subangular sandstone gravel and cobbles; many medium and fine roots; very strongly acid; gradual smooth boundary.

BE—7 to 10 inches; yellowish brown (10YR 5/6) gravelly loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; 20 percent subangular sandstone gravel and cobbles; very strongly acid; gradual smooth boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/6) gravelly loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds and in pores; 25 percent subangular sandstone gravel and cobbles; very strongly acid; gradual wavy boundary.

Bt2—18 to 32 inches; yellowish brown (10YR 5/6) gravelly clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds and in pores; common medium prominent light brownish gray (10YR 6/2) iron depletions along faces of peds; 25 percent subangular sandstone gravel and cobbles; very strongly acid; clear wavy boundary.

Btx1—32 to 42 inches; light brown (7.5YR 6/4) very gravelly clay loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle, slightly sticky and slightly plastic; very few roots along prism faces; common distinct clay films on faces of peds; common coarse prominent light gray (10YR 7/2) iron depletions along faces of peds; many medium distinct strong brown (7.5YR 5/8) iron concentrations; 40 percent subangular sandstone gravel and cobbles; very strongly acid; gradual wavy boundary.

Btx2—42 to 65 inches; strong brown (7.5YR 5/6) very gravelly clay loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle, slightly sticky and slightly plastic; very few roots along prism faces; common distinct clay films on faces of peds; common coarse prominent light gray (10YR 7/2) iron depletions along faces of peds; common medium faint strong brown (7.5YR 5/8) iron concentrations; 40 percent subangular sandstone gravel and cobbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 80 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 20 to 36 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: 5 to 30 percent
Size of rock fragments: Channers to boulders
Kind of rock fragments: Sandstone, shale, and siltstone
Soil reaction: In unlimed areas extremely acid to strongly acid

A horizon:
Hue—10YR or 7.5YR; value—3 to 6; chroma—1 to 4
Texture of the fine earth fraction—loam
Content of rock fragments—5 to 40 percent

E horizon:
Hue—10YR or 7.5YR; value—5 to 8; chroma—2 to 4
Texture of the fine earth fraction—loam, silt loam, or sandy loam
Content of rock fragments—10 to 40 percent

BE horizon:
Hue—10YR or 7.5YR; value—5 or 6; chroma—5 or 6
Texture of the fine earth fraction—loam or silt loam
Content of rock fragments—5 to 40 percent

Bt horizon:
Hue—10YR or 7.5YR; value—5 or 6; chroma—3 to 6
Texture of the fine earth fraction—clay loam, silt loam, loam, or sandy clay loam
Content of rock fragments—5 to 40 percent in individual horizons
The horizon has redoximorphic features.

Btx horizon:
Hue—10YR to 5YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—clay loam or loam
Content of rock fragments—10 to 60 percent
The horizon has redoximorphic features.

C horizon (where it occurs):
Hue—10YR to 5YR; value—5 or 6; chroma—2 to 6
Texture of the fine earth fraction—clay loam, loam, or sandy clay loam
Content of rock fragments—10 to 60 percent
In most pedons the horizon has redoximorphic features.

Calvin Series

Depth to bedrock: Moderately deep
Drainage class: Well drained
Landform: Hills
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from acid, red to reddish brown shale, siltstone, and sandstone
Slope range: 3 to 25 percent
Associated soils: Klinesville, Leck Kill, Hustontown, Weikert, Berks, Basher, and Barbour
Taxonomic class: Loamy-skeletal, mixed, mesic Typic Dystrochrepts

Typical Pedon

Calvin channery silt loam, in an area of Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes, in Taylor Township, Fulton County, 2 miles northeast of Saluvia, 200 feet east of intersection of Pennsylvania Township Routes T423 and T419; USGS Hustontown topographic quadrangle; lat. 40 degrees 1 minute 41 seconds N. and long. 78 degrees 4 minutes 59 seconds W.

Ap—0 to 8 inches; reddish brown (5YR 4/3) channery silt loam; weak fine granular structure; friable, nonsticky, nonplastic; 20 percent angular shale channers; common very fine roots; moderately acid; abrupt smooth boundary.
Bw1—8 to 24 inches; yellowish red (5YR 4/6) very channery silt loam; weak fine subangular blocky structure; friable, slightly sticky, nonplastic; 35 percent angular shale channers; few very fine roots; strongly acid; gradual wavy boundary.
Bw2—24 to 30 inches; yellowish red (5YR 4/6) very channery loam; weak fine subangular blocky structure; friable, slightly sticky, nonplastic; 45 percent angular shale channers; few very fine roots; strongly acid; gradual wavy boundary.
BC—30 to 34 inches; reddish brown (5YR 4/4) very channery loam; weak fine subangular blocky structure; firm, nonsticky, nonplastic; few very fine roots; 50 percent angular shale channers; very strongly acid; abrupt wavy boundary.
C—34 to 35 inches; reddish brown (2.5YR 4/4) extremely channery loam; massive; firm, nonsticky, nonplastic; 70 percent angular shale channers; few fine roots; very strongly acid; clear wavy boundary.
R—35 inches; dusky red (10R 3/3) fractured shale bedrock; more than 4 inches between fractures; bedrock inclination more than 30 degrees; few faint clay and silt coatings between rock fragments.

Range in Characteristics

Thickness of the solum: 20 to 35 inches
Depth to bedrock: 20 to 40 inches
Content of clay in the control section: 15 to 30 percent
Content of rock fragments in the control section: More than 35 percent
Kind of rock fragments: Shale, siltstone, and fine grained sandstone
Reaction: In unlimed areas moderately acid to very strongly acid

A horizon:
Hue—5YR or 7.5YR; value—2 to 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—15 to 35 percent

Bw and BC horizons:
Hue—2.5YR or 5YR; value—4 or 5; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—20 to 60 percent in individual subhorizons

C horizon:
Hue—2.5YR or 5YR; value—3 to 5; chroma—3 or 4
Texture of the fine earth fraction—loam or silt loam
Content of rock fragments—50 to 90 percent

Carbo Series

Depth to bedrock: Moderately deep
Drainage class: Well drained

Landform: Uplands in the limestone valley
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from limestone
Slope range: 3 to 50 percent
Associated soils: Hagerstown, Murrill, Clarksburg, Penlaw, and Pecktonville
Taxonomic class: Very-fine, mixed, mesic Typic Hapludalfs

Typical Pedon

Carbo silty clay loam, in an area of Hagerstown-Carbo silty clay loams, 8 to 15 percent slopes, in Guilford Township, Franklin County, 0.25 mile west of Marion, 500 feet west of intersection of Pennsylvania Township Route T661 and Pennsylvania Route 0011; USGS Greencastle topographic quadrangle; lat. 39 degrees 51 minutes 40 seconds N. and long. 77 degrees 42 minutes 18 seconds W.

Ap—0 to 8 inches; brown (7.5YR 4/2) silty clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; 5 percent subangular chert and limestone channers; neutral; abrupt smooth boundary.
Bt1—8 to 16 inches; reddish yellow (7.5YR 6/6) clay; moderate medium subangular blocky structure; friable, moderately sticky, moderately plastic; few distinct clay films on faces of peds and in pores; common fine roots; 3 percent subangular chert and limestone channers; neutral; clear wavy boundary.
Bt2—16 to 34 inches; strong brown (7.5YR 5/6) clay; strong medium subangular blocky structure; firm, very sticky, very plastic; common prominent clay films on faces of peds and in pores; few fine roots; common fine iron oxide concretions; 2 percent subangular chert and limestone pebbles; neutral; clear wavy boundary.
BC—34 to 37 inches; strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm, moderately sticky, moderately plastic; few faint clay films on faces of peds and in pores; few fine roots; 5 percent angular chert and limestone channers; neutral; abrupt wavy boundary.
R—37 inches; hard bluish gray (5B 6/1) fractured limestone; more than 8 inches between fractures; bedrock inclination more than 30 degrees; violently effervescent.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Content of clay in the control section: 40 to 80 percent
Content of rock fragments in the control section: 0 to 10 percent
Kind of rock fragments: Limestone, chert, and calcareous shale
Reaction: In unlimed areas moderately acid to neutral in the upper horizons and neutral or slightly alkaline below

A horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—2 to 5
Texture of the fine earth fraction—silty clay loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Hue—7.5YR or 5YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—clay
Content of rock fragments—0 to 10 percent

BC horizon:
Hue—7.5YR; value—4 or 5; chroma—4 or 8
Texture of the fine earth fraction—clay or silty clay
Content of rock fragments—0 to 10 percent

C horizon (where it occurs):
Hue—7.5YR or 10YR; value—4 or 5; chroma—4 to 8
Texture of the fine earth fraction—clay or silty clay
Content of rock fragments—0 to 10 percent

Cedarcreek Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Mountaintops
Position on landform: Summits and backslopes
Parent material: A mixture of soil material and rock fragments disturbed during strip mining
Slope range: 3 to 80 percent
Associated soils: Dekalb, Hazleton, and Buchanan
Taxonomic class: Loamy-skeletal, mixed, acid, mesic, Typic Udorthents

Typical Pedon

Cedarcreek very channery loam, 3 to 25 percent slopes, in Wells Township, Fulton County, 1 mile south of Wood; USGS Saxton topographic quadrangle; lat. 40 degrees 8 minutes 36 seconds N. and long. 78 degrees 8 minutes 21 seconds W.

A—0 to 3 inches; dark brown (10YR 4/3) very channery loam; very weak fine granular structure; friable, nonsticky and nonplastic; common fine and medium roots; 40 percent angular shale channers; very strongly acid; gradual wavy boundary.
C1—3 to 32 inches; variegated brown (7.5YR 5/4) and

olive brown (2.5Y 4/4) very channery loam; massive; very firm, nonsticky and nonplastic; few fine roots; 60 angular shale percent channers and stones; very strongly acid.

C2—32 to 60 inches; variegated yellowish brown (10YR 5/4) and olive brown (2.5Y 4/4) extremely channery loam; massive; very firm, nonsticky and nonplastic; 70 percent angular shale channers and stones; very strongly acid.

Range in Characteristics

Depth to bedrock: More than 60 inches
Content of clay in the control section: 18 to 25 percent
Content of rock fragments in the control section: 35 to 65 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Small amounts of coal, but mainly acid shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—7.5YR to 5Y; value—2 to 5; chroma—1 to 6
Texture of the fine earth fraction—loam
Content of rock fragments—35 to 60 percent

C horizon:
Hue—7.5YR to 5Y; value—2 to 6; chroma—1 to 8
Texture of the fine earth fraction—loam, silt loam, or sandy loam
Content of rock fragments—35 to 80 percent

Clarksburg Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Moderately well drained
Landform: Uplands in the limestone valley
Position on landform: Toeslopes and swales
Parent material: Colluvium derived from limestone, calcareous and noncalcareous shale, and sandstone
Slope range: 3 to 8 percent
Associated soils: Hagerstown, Carbo, Nollville, Murrill, Penlaw, Lindside, Funkstown, and Melvin
Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Fragiudalfs

Typical Pedon

Clarksburg silt loam, 0 to 3 percent slopes, in Peters Township, Franklin County, 0.5 mile south of Lemasters, 1,000 feet southwest of intersection of Pennsylvania Route 3009 and Pennsylvania Township Route T417, about 500 feet west of Route 3009; USGS Williamson topographic quadrangle; lat. 39 degrees 51 minutes 1 second N. and long. 77 degrees 51 minutes 40 seconds W.

Ap—0 to 10 inches; brown to dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable, slightly sticky and slightly plastic; common fine roots; 2 percent subangular sandstone and chert channers; slightly acid; abrupt smooth boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; very few faint clay films on faces of peds and in pores; 2 percent subangular sandstone and chert channers; slightly acid; gradual wavy boundary.

Bt2—18 to 24 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds and in pores; slightly acid; gradual wavy boundary.

Bt3—24 to 32 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; common distinct clay films on faces of peds and in pores; common medium prominent dark grayish brown (10YR 4/2) iron depletions near the surfaces of peds and common medium distinct brownish yellow (10YR 6/8) iron concentrations; slightly acid; gradual wavy boundary.

Btx—32 to 48 inches; yellowish brown (10YR 5/6) and dark brown (10YR 4/3) silty clay loam; strong very coarse prismatic structure parting to moderate medium subangular blocky; firm and brittle, sticky and plastic; many distinct grayish brown (10YR 5/2) clay films on vertical faces of prisms, and common distinct clay films on faces of peds; a few roots along prism faces; 5 percent subangular chert and sandstone channers; slightly acid; gradual wavy boundary.

C—48 to 65 inches; yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) silty clay loam; weak very coarse prismatic structure parting to massive; extremely firm, sticky and plastic; 5 percent subangular chert channers; slightly acid.

Range in Characteristics

Thickness of the solum: 40 to 70 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 20 to 36 inches
Content of clay in the control section: 22 to 34 percent
Content of rock fragments in the control section: Less than 25 percent
Kind of rock fragments: Limestone, chert, shale,

siltstone, and sandstone
Reaction: In unlimed areas strongly acid to slightly acid

A horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silty clay loam, loam, clay loam, or silt loam
Content of rock fragments—0 to 25 percent
The horizon has redoximorphic features.

Btx horizon:
Hue—5YR to 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—silty clay loam or clay loam
Content of rock fragments—5 to 30 percent
The horizon has redoximorphic features.

C horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—silty clay loam, silt loam, or clay loam
Content of rock fragments—5 to 80 percent
In some pedons the horizon has redoximorphic features.

Clymer Series

Depth to bedrock: Deep
Drainage class: Well drained
Landform: Mountains
Position on landform: Backslopes and shoulders
Parent material: Residuum derived from acid, gray and brown sandstone, shale, and siltstone
Slope range: 8 to 25 percent
Associated soils: Hazleton, Dekalb, Laidig, and Buchanan
Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludults

Typical Pedon

Clymer channery loam, in an area of Hazleton and Clymer soils, 8 to 25 percent slopes, extremely stony, in Brush Creek Township, Fulton County, 1,000 feet south of Fisher Point; USGS Wells Tannery topographic quadrangle; lat. 40 degrees 0 minutes 20 seconds N. and long. 78 degrees 7 minutes 57 seconds W.

Oi—2 inches to 0; slightly decomposed leaf litter.

Oe—0 to 2 inches; moderately decomposed organic materials.

A—2 to 6 inches; very dark grayish brown (10YR 3/1) channery loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine and medium roots; 25 percent subangular sandstone channers and cobbles; very strongly acid; abrupt wavy boundary.

E—6 to 10 inches; brown (10YR 5/3) channery sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine and medium roots; 25 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.

BE—10 to 16 inches; yellowish brown (10YR 5/4) channery loam; weak fine granular structure; very friable, nonsticky and nonplastic; many medium and fine roots; 20 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.

Bt1—16 to 39 inches; yellowish brown (10YR 5/6) channery loam; moderate medium subangular blocky structure; firm, slightly sticky, nonplastic; common medium and fine roots; 20 percent subangular sandstone channers; few distinct clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

BC—39 to 42 inches; brownish yellow (10YR 6/6) channery loam; weak medium subangular blocky structure; firm, slightly sticky, nonplastic; few fine roots; 30 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.

C—42 to 56 inches; yellowish brown (10YR 5/4) very channery sandy loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; 50 percent subangular sandstone channers and cobbles; very strongly acid; abrupt wavy boundary.

R—56 inches; yellowish brown (10YR 5/6) and gray (10YR 5/1) weathered sandstone bedrock; 4 to 80 inches between fractures with minimal displacement.

Range in Characteristics

Thickness of the solum: 25 to 40 inches
Depth to bedrock: 40 to 60 inches
Content of sand in the control section: More than 48 percent
Content of clay in the control section: 18 to 25 percent
Content of rock fragments in the control section: Less than 35 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Sandstone, shale, and siltstone

Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR; value—2 or 3; chroma—1 or 2
Texture of the fine earth fraction—loam
Content of rock fragments—10 to 40 percent in individual horizons

E or BE horizon:
Hue—10YR; value—4 or 5; chroma—2 to 4
Texture of the fine earth fraction—sandy loam or loam
Content of rock fragments—10 to 40 percent in individual horizons

Bt horizon:
Hue—10YR or 7.5YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—loam or clay loam
Content of rock fragments—10 to 50 percent in individual horizons

BC or C horizon:
Hue—7.5YR or 10YR; value—3 to 6; chroma—3 to 8
Texture of the fine earth fraction—sandy loam or loam
Content of rock fragments—20 to 80 percent

Dekalb Series

Depth to bedrock: Moderately deep
Drainage class: Well drained
Landform: Mountains
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from quartzite or sandstone
Slope range: 0 to 75 percent
Associated soils: Hazleton, Sideling, Laidig, Buchanan, Andover, Clymer, and Cedarcreek
Taxonomic class: Loamy-skeletal, siliceous, mesic Typic Dystrochrepts

Typical Pedon

Dekalb cobbly sandy loam, in an area of Hazleton and Dekalb soils, 25 to 75 percent slopes, extremely stony, in Licking Creek Township, in Fulton County, 0.9 mile north of intersection of U.S. 30 and Pennsylvania Township Route T428, about 1,000 feet west of T428; USGS Hustontown topographic quadrangle; lat. 40 degrees 1 minute 32 seconds N. and long. 78 degrees 6 minutes 42 seconds W.

Oi—1 inch to 0; slightly decomposed leaves and twigs.
Oe—0 to 1 inch; moderately decomposed mat of roots and leaves.
A—1 to 4 inches; very dark gray (10YR 3/1) cobbly sandy loam; weak fine granular structure; loose, nonsticky and nonplastic; many fine and medium roots; 35 percent angular sandstone cobbles and channers; very strongly acid; clear smooth boundary.
E—4 to 9 inches; pale brown (10YR 6/3) cobbly sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; many medium and fine roots; 30 percent angular sandstone cobbles and channers; very strongly acid; clear smooth boundary.
Bw1—9 to 20 inches; yellowish brown (10YR 5/4) cobbly sandy loam; weak fine and medium subangular blocky structure; friable, nonsticky and nonplastic; common medium and fine roots; 35 percent angular sandstone cobbles and channers; very strongly acid; gradual smooth boundary.
Bw2—20 to 30 inches; yellowish brown (10YR 5/6) very cobbly sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; 50 percent angular sandstone cobbles and channers; strongly acid; gradual wavy boundary.
C—30 to 34 inches; yellowish brown (10YR 5/4) extremely cobbly sandy loam; single grain; loose, nonsticky and nonplastic; few fine roots; 90 percent angular sandstone cobbles and channers; strongly acid; clear wavy boundary.
R—34 inches; light yellowish brown (10YR 6/4) and gray (10YR 5/1) slightly weathered sandstone bedrock; more than 10 inches between fractures; bedrock inclination of 5 to 30 degrees.

Range in Characteristics

Thickness of the solum: 20 to 34 inches
Depth to bedrock: 20 to 40 inches
Content of clay in the control section: 6 to 18 percent
Content of rock fragments in the control section: 35 to 75 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR; value—2 or 3; chroma—1 or 2
Texture of the fine earth fraction—sandy loam
Content of rock fragments—10 to 60 percent

E horizon:
Hue—10YR; value—5 or 6; chroma—1 to 4
Texture of the fine earth fraction—sandy loam or loam
Content of rock fragments—10 to 60 percent

B horizon:
Hue—7.5YR to 10YR; value—5 to 8; chroma—4 to 8
Texture of the fine earth fraction—sandy loam, loam, or fine sandy loam
Content of rock fragments—10 to 60 percent in individual horizons

C horizon:
Hue—7.5YR to 10YR; value—5 or 6; chroma—4 to 6
Texture of the fine earth fraction—sandy loam or loamy sand
Content of rock fragments—50 to 90 percent

Elliber Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Ridges
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from cherty limestone
Slope range: 3 to 25 percent
Associated soils: Wurno, Frankstown, Nollville, Pectonville, and Murrill
Taxonomic class: Loamy-skeletal, mixed, mesic Typic Hapludults

Typical Pedon

Elliber very channery silt loam, 8 to 15 percent slopes, in Bethel Township, Fulton County, on Tonoloway Ridge, 1.0 mile south of intersection of Pennsylvania Routes 3011 and 0522, about 1,000 feet west of Route 3011; USGS Needmore topographic quadrangle; lat. 39 degrees 49 minutes 34 seconds N. and long. 78 degrees 8 minutes 21 seconds W.

Ap—0 to 8 inches; dark brown (10YR 3/3) very channery silt loam; weak very fine crumb structure; very friable, nonsticky and nonplastic; many fine roots; 40 percent angular chert channers; extremely acid; abrupt smooth boundary.
BE—8 to 22 inches; light yellowish brown (10YR 6/4) very channery silt loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; 45 percent angular chert channers; strongly acid; clear wavy boundary.
Bt1—22 to 26 inches; light brown (7.5YR 6/4) extremely channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky, nonplastic; few fine roots; few faint clay films on faces of peds and in pores; 60 percent angular chert channers; strongly acid; gradual irregular boundary.
Bt2—26 to 49 inches; reddish yellow (7.5YR 6/6) extremely channery silt loam; weak medium subangular blocky structure; friable, slightly sticky, nonplastic; few fine roots; fine faint clay films on faces of peds and in pores; few roots; 65 percent angular chert channers; strongly acid.
Bt3—49 to 65 inches; light brown (7.5YR 6/4) extremely channery silt loam; weak coarse subangular blocky structure; friable, nonsticky and nonplastic; common faint clay films on faces of peds and in pores; 80 percent angular chert channers; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 70 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 12 to 27 percent
Content of sand in the control section: More than 20 percent
Content of rock fragments in the control section: More than 50 percent
Kind of rock fragments: Some fine-grained sandstone, shale, and limestone, but mainly siliceous siltstone and chert
Reaction: In unlimed areas extremely acid to strongly acid

A horizon:
Hue—10YR; value—3; chroma—3
Texture of the fine earth fraction—silt loam
Content of rock fragments—40 to 60 percent

E horizon (if it occurs):
Hue—7.5YR or 10YR; value—6 or 7; chroma—2 or 3
Texture of the fine earth fraction—loam or silt loam
Content of rock fragments—40 to 60 percent

BE horizon:
Hue—7.5YR or 10YR; value—5 or 6; chroma—3 or 4
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—40 to 60 percent

Bt horizon:
Hue—7.5YR or 10YR; value—5 or 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam, clay loam, or silty clay loam
Content of rock fragments—40 to 70 percent in individual horizons

C horizon (if it occurs):
Hue—7.5YR or 10YR; value—5 or 6; chroma—3 to 6
Texture of the fine earth fraction—silt loam, loam, or clay loam
Content of rock fragments—60 to 80 percent

Ernest series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Moderately well drained
Landform: Hills
Position on landform: Footslopes and toeslopes
Parent material: Colluvium derived from acid shale, siltstone, and some sandstone
Slope range: 3 to 8 percent
Associated soils: Berks, Atkins, Philo, Bedington, Weikert, and Brinkerton
Taxonomic class: Fine-loamy, mixed, mesic Aquic Fragiudults

Typical Pedon

Ernest silt loam, 3 to 8 percent slopes, in Licking Creek Township, Fulton County, 2,000 feet northeast of intersection of Pennsylvania Township Routes T420 and T419, about 1,300 feet east of T419; USGS Hustontown topographic quadrangle; lat. 40 degrees 0 minutes 36 seconds N. and long. 78 degrees 3 minutes 19 seconds W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; moderate fine and medium granular structure; very friable, nonsticky and nonplastic; many medium and fine roots; 10 percent subangular shale channers; slightly acid; abrupt smooth boundary.
E—7 to 13 inches; light yellowish brown (10YR 6/4) silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, nonplastic; common fine roots; 10 percent subangular shale channers; moderately acid; clear wavy boundary.
Bt—13 to 27 inches; brownish yellow (10YR 6/6) channery silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and plastic; few fine and very fine roots; distinct clay films on faces of peds and in pores; common medium distinct light gray (10YR 7/2) iron depletions on surfaces of peds; 15 percent subangular shale channers; strongly acid; clear wavy boundary.
Btx1—27 to 43 inches; strong brown (7.5YR 5/8) channery silty clay loam; very coarse prismatic structure parting to strong medium angular blocky structure; firm and brittle, sticky and plastic; distinct clay films on faces of peds; many medium and coarse prominent light gray (10YR 7/2) iron depletions on surfaces of peds; 15 percent subangular shale channers; strongly acid; clear irregular boundary.
Btx2—43 to 65 inches; brown (7.5YR 5/6) channery silt loam; weak very coarse prismatic structure parting to moderate medium platy; firm and brittle, slightly sticky, nonplastic; distinct clay films on faces of peds; few prominent black (N 2/) iron-manganese stains on faces of peds; few coarse prominent light gray (10YR 6/2) iron depletions on surfaces of peds; common fine distinct reddish yellow (7.5YR 6/8) iron concentrations; 25 percent subangular shale channers; strongly acid.

Range in Characteristics

Thickness of the solum: 36 to 70 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 20 to 36 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Shale, sandstone, and siltstone
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

E horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—silt loam
Content of rock fragments—5 to 25 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 8
Texture of the fine earth fraction—silty clay loam or silt loam
Content of rock fragments—5 to 30 percent
The horizon has redoximorphic features.

Btx horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—2 to 8
Texture of the fine earth fraction—silty clay loam, silt loam, or clay loam
Content of rock fragments—5 to 40 percent
The horizon has redoximorphic features.

C horizon (if it occurs):
Hue—7.5YR or 10YR; value—4 to 6; chroma—2 to 6
Texture of the fine earth fraction—silt loam, clay loam, or silty clay loam
Content of rock fragments—5 to 50 percent
The horizon has redoximorphic features.

Frankstown Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Ridges
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from siliceous and cherty limestone interbedded with calcareous shale and sandstone
Slope range: 3 to 35 percent
Associated soils: Elliber, Ryder, Nollville, Hagerstown, Murrill, and Pectonville
Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludults

Typical Pedon

Frankstown channery silt loam, 8 to 15 percent slopes, in Bethel Township, Fulton County, 2.5 miles south of Needmore on Tonoloway Ridge, 1,200 feet south of intersection of Pennsylvania Township Routes T349 and T328, about 150 feet west of T328; USGS Needmore topographic quadrangle; lat. 39 degrees 48 minutes 46 seconds N. and long. 78 degrees 10 minutes 12 seconds W.

Ap—0 to 9 inches; dark brown (10YR 4/3) channery silt loam; weak fine granular structure; friable, nonsticky, nonplastic; many fine roots; 20 percent angular chert and shale channers; moderately acid; abrupt smooth boundary.
E—9 to 12 inches; brown (10YR 5/3) channery silt loam; weak thin platy structure; friable, nonsticky, nonplastic; common fine roots; 20 percent angular chert and shale channers; moderately acid; clear wavy boundary.
BE—12 to 16 inches; brown (7.5YR 5/4) channery silt loam; moderate fine subangular blocky structure; firm, slightly sticky, nonplastic; very few faint clay films on faces of peds and in pores; common fine roots; 15 percent angular chert and shale channers; strongly acid; gradual wavy boundary.
Bt—16 to 37 inches; strong brown (7.5YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; common prominent clay films on faces of peds and in pores; few fine roots; 20 percent angular chert and shale channers; strongly acid; gradual wavy boundary.
BC—37 to 65 inches; strong brown (7.5YR 5/6) very channery silt loam with pockets of silty clay; weak medium and coarse subangular blocky structure; firm, slightly sticky and slightly plastic; very few faint clay films on faces of peds and in pores; few fine roots; 40 percent angular chert and shale channers; moderately acid.

Range in Characteristics

Depth to bedrock: More than 60 inches
Content of clay in the control section: 25 to 35 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Calcareous shale and siltstone, chert, and siliceous limestone
Reaction: In unlimed areas moderately acid to very strongly acid

Ap horizon:
Hue—10YR; value—4 or 5; chroma—3
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

E horizon:
Hue—7.5YR or 10YR; value—5 or 6; chroma—3
Texture of the fine earth fraction—silt loam
Content of rock fragments—5 to 25 percent

BE horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—4 to 8
Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—5 to 30 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—4 to 8
Texture of the fine earth fraction—silty clay loam or silt loam
Content of rock fragments—5 to 40 percent in individual horizons

BC horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8

Texture of the fine earth fraction—silt loam, silty clay loam, or silty clay
Content of rock fragments—10 to 40 percent

Funkstown Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Swales on uplands of the limestone valley
Position on landform: Toeslopes
Parent material: Colluvium and alluvium from the surrounding soils formed in limestone
Slope range: 0 to 3 percent
Associated soils: Hagerstown, Carbo, and Clarksburg
Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Hapludalfs

Typical Pedon

Funkstown silt loam, in Southhampton Township, Franklin County, 2 miles south of Shippensburg, 2,000 feet northwest of intersection of Pennsylvania Township Routes T645 and T619, about 800 feet southwest of T645; USGS Shippensburg topographic quadrangle; lat. 40 degrees 1 minute 3 seconds N., long. 77 degrees 32 minutes 34 seconds W.

Ap1—0 to 12 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable, nonsticky and nonplastic; common very fine and fine roots; 5 percent subangular cherty limestone gravel; abrupt smooth boundary.
Ap2—12 to 18 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine and medium granular structure; friable, nonsticky and nonplastic; common very fine and fine roots; 5 percent subangular cherty limestone gravel; neutral; clear smooth boundary.
BE—18 to 24 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few very fine and fine roots; 10 percent subangular cherty limestone gravel; neutral; clear wavy boundary.
Bt1—24 to 32 inches; brown (10YR 5/3) gravelly silt loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few very fine and fine roots; few faint clay films on faces of peds and in pores; 20 percent subangular cherty limestone gravel; neutral; gradual wavy boundary.
Bt2—32 to 40 inches; brown (7.5YR 5/4) channery silty clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few very fine and fine roots; few faint clay films on faces of peds and in pores; common fine rounded very dark gray (7.5YR 3/1) hard iron-manganese concretions; 30 percent subangular cherty limestone channers and gravel; neutral; gradual wavy boundary.
2Bt—40 to 65 inches; variegated yellowish red (5YR 5/6) and reddish brown (5YR 4/4) silty clay; moderate medium subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; common fine rounded very dark gray (7.5YR 3/1) very hard iron-manganese concretions; 5 percent subangular cherty limestone channers; neutral.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: Less than 35 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Limestone, chert, dolomite, and shale
Reaction: In unlimed areas slightly acid to slightly alkaline

A horizon:
Hue— 7.5YR or 10YR; value—3 to 5; chroma—3 to 6
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

BE or Bt horizon:
Hue—5YR or 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam, silty clay loam, or clay loam
Content of rock fragments—0 to 30 percent

2Bt horizon:
Hue—5YR to 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silty clay loam, clay loam, clay, or silt loam
Content of rock fragments—0 to 30 percent

Hagerstown Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Uplands in the limestone valley
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from limestone
Slope range: 3 to 35 percent
Associated soils: Funkstown, Carbo, Murrill, Clarksburg, and Penlaw
Taxonomic class: Fine, mixed, mesic Typic Hapludalfs

Typical Pedon

Hagerstown silt loam, 3 to 8 percent slopes, in Guilford Township, Franklin County, 1 mile southeast of Chambersburg, 3,000 feet northwest of intersection of Pennsylvania Township Route T489 and Pennsylvania Route 2027, about 1,200 feet north of T489; USGS Chambersburg topographic quadrangle; lat. 39 degrees 54 minutes 33 seconds N. and long. 77 degrees 38 minutes 29 seconds W.

Ap—0 to 9 inches; brown to dark brown (7.5YR 4/4) silt loam; moderate coarse granular structure; friable, slightly sticky and slightly plastic; many fine roots; 5 percent subrounded to angular limestone, sandstone, and chert channers and cobbles; neutral abrupt smooth boundary.

Bt1—9 to 21 inches; reddish brown (5YR 5/4) silty clay loam; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds and in pores; 5 percent subrounded to subangular limestone, sandstone, and chert channers; slightly acid; clear wavy boundary.

Bt2—21 to 29 inches; yellowish red (5YR 4/6) silty clay; moderate medium and coarse subangular blocky structure; firm, sticky and plastic; few fine roots; few faint clay films on faces of peds and in pores; 5 percent angular limestone and chert channers; neutral; gradual wavy boundary.

Bt3—29 to 50 inches; yellowish red (5YR 5/8) clay; strong coarse subangular blocky structure; firm, sticky and plastic; few fine roots; common distinct clay films on faces of peds and in pores; common prominent black (N 2/) coatings on faces of peds; neutral; gradual wavy boundary.

Bt4—50 to 65 inches; yellowish red (5YR 4/6) clay; strong coarse subangular blocky structure; firm, sticky, plastic; many prominent clay films on faces of peds and in pores; neutral.

Range in Characteristics

Thickness of the solum: 40 to 72 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 35 to 60 percent
Content of rock fragments in the control section: Less than 15 percent
Kind of rock fragments: Limestone and chert
Reaction: In unlimed areas strongly acid to slightly acid in the upper part of the solum and strongly acid to neutral in the lower part

A horizon:
Hue—7.5YR or 5YR; value—3 to 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Hue—5YR or 2.5YR; value—4 or 5; chroma—4 to 8
Texture of the fine earth fraction—silty clay, silty clay loam, or clay
Content of rock fragments—0 to 15 percent

C horizon (if it occurs):
Hue—7.5YR to 2.5YR; value—3 to 6; chroma—4 to 6
Texture of the fine earth fraction—silty clay loam, silty clay, or clay
Content of rock fragments—0 to 40 percent

Hazleton Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Mountains
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum and soil creep derived from quartzite or sandstone
Slope range: 0 to 75 percent
Associated soils: Clymer, Sideling, Dekalb, Laidig, Buchanan, Andover, Cedarcreek, Berks, and Weikert
Taxonomic class: Loamy-skeletal, siliceous, mesic, Typic Dystrochrepts

Typical Pedon

Hazleton channery sandy loam, in an area of Hazleton and Dekalb soils, 8 to 25 percent slopes, extremely stony, in Wells Township, Fulton County, 0.5 mile south of intersection of Pennsylvania Routes 0915 and 4006; USGS Wells Tannery topographic quadrangle; lat. 40 degrees 2 minutes 24 seconds N. and long. 78 degrees 8 minutes 4 seconds W.

A—0 to 2 inches; very dark gray (10YR 3/1) channery sandy loam; weak very fine granular structure; very friable, nonsticky and nonplastic; many fine and medium roots; 20 percent subangular sandstone channers and cobbles; very strongly acid; abrupt wavy boundary.

E—2 to 10 inches; yellowish brown (10YR 5/4) channery sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; common medium and fine roots; 20 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.

Bw1—10 to 18 inches; yellowish brown (10YR 5/6) channery sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; common medium and fine roots; 25 percent

subangular sandstone channers; very strongly acid; clear wavy boundary.
Bw2—18 to 26 inches; yellowish brown (10YR 5/8) channery sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few fine roots; 35 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.
Bw3—26 to 32 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few fine roots; 40 percent subangular sandstone channers; very strongly acid; gradual wavy boundary.
Bw4—32 to 42 inches; light yellowish brown (10YR 6/4) very channery sandy loam; weak medium subangular blocky structure; firm, nonsticky and nonplastic; 40 percent subangular sandstone channers and cobbles; very strongly acid; clear wavy boundary.
C—42 to 65 inches; light yellowish brown (10YR 6/4) extremely channery sandy loam; weak fine subangular blocky structure; firm, nonsticky and nonplastic; 70 percent subangular sandstone channers and cobbles; very strongly acid; abrupt wavy boundary.
R—65 inches; yellowish brown (10YR 5/6) and gray (10YR 5/1) slightly weathered sandstone bedrock; 4 to 80 inches between fractures with minimal displacement; bedrock inclination of 5 to 30 degrees.

Range in Characteristics

Thickness of the solum: 25 to 50 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 7 to 18 percent
Content of rock fragments in the control section: More than 35 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Sandstone, shale, and siltstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR; value—1 to 4; chroma—1 or 2
Texture of the fine earth fraction—sandy loam
Content of rock fragments—20 to 50 percent

E horizon:
Hue—10YR; value—4 or 5; chroma—1 to 4
Texture of the fine earth fraction—sandy loam or loam
Content of rock fragments—20 to 50 percent

Bw horizon:
Hue—10YR or 7.5YR; value—3 to 6; chroma—3 to 8
Texture of the fine earth fraction—sandy loam or loam
Content of rock fragments—5 to 60 percent in individual horizons

C horizon:
Hue—7.5YR to 2.5YR; value—3 to 6; chroma—3 to 8
Texture of the fine earth fraction—sandy loam, loam, or loamy sand
Content of rock fragments—35 to 80 percent

Hustontown Series

Depth to bedrock: Very deep; shallow or moderately deep to fragipan
Drainage class: Moderately well drained
Landform: Hills
Position on landform: Footslopes and toeslopes
Parent material: Colluvium derived from acid, red shale, siltstone, and sandstone
Slope range: 3 to 8 percent
Associated soils: Leck Kill, Calvin, Klinesville, Brinkerton, Basher, and Barbour
Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Fragiudalfs

Typical Pedon

Hustontown silt loam, 3 to 8 percent slopes, in Thompson Township, Fulton County, 1.15 miles west of Dickeys Mountain, 1.4 miles northeast of intersection of Pennsylvania Routes 2002 and 0928, about 1,800 feet west of Route 0928; USGS Big Cove Tannery topographic quadrangle; lat. 39 degrees 46 minutes 35 seconds N. and long. 78 degrees 5 minutes 58 seconds W.

Ap—0 to 8 inches; dark reddish gray (5YR 4/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 5 percent subangular shale and sandstone channers; moderately acid; abrupt smooth boundary.
BE—8 to 12 inches; reddish brown (5YR 5/3) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; common fine and medium roots; 5 percent subangular shale and sandstone channers; moderately acid; clear wavy boundary.
Bt1—12 to 20 inches; reddish brown (5YR 5/4) silt loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic;

common fine and medium roots; few distinct clay films on faces of peds and in pores; 10 percent subangular shale and sandstone channers; moderately acid; clear wavy boundary.

Bt2—20 to 30 inches; yellowish red (5YR 5/6) and reddish brown (5YR 5/3) channery silt loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots; few distinct clay films on faces of peds and in pores; common fine and medium distinct pinkish gray (5YR 6/2) iron depletions on faces of peds and in pores; 15 percent subangular shale and sandstone channers; strongly acid; clear wavy boundary.

Btx1—30 to 55 inches; reddish brown (5YR 5/4) channery silt loam; moderate very coarse prismatic structure parting to moderate fine and medium platy; very firm and brittle, slightly sticky and slightly plastic; few fine roots between vertical faces of peds; common prominent light gray (5YR 7/1) clay films on vertical faces of peds; few prominent black (N 2/) iron-manganese stains on faces of platy peds; few medium distinct pinkish gray (5YR 7/2) iron depletions in matrix; 20 percent subangular shale and sandstone channers; moderately acid; gradual wavy boundary.

Btx2—55 to 65 inches; strong brown (7.5YR 5/6) channery silty clay loam; moderate very coarse prismatic structure parting to moderate medium platy; very firm and brittle, slightly sticky and slightly plastic; very few fine roots between vertical faces of peds; common prominent light gray (5YR 7/1) clay films on vertical faces of peds; very few prominent black (N 2/) iron-manganese stains on faces of platy peds; few medium prominent pinkish gray (5YR 7/2) iron depletions in matrix; 20 percent subangular sandstone and shale channers; moderately acid.

Range in Characteristics

Thickness of the solum: 40 to 65 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 18 to 32 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Shale, siltstone, or sandstone
Reaction: In unlimed areas extremely acid to strongly acid in the upper part of the solum and slightly acid to strongly acid in the lower part

A horizon:
Hue—5YR or 7.5YR; value—2 to 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

BE horizons:
Hue—2.5YR or 5YR; value—4 or 5; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—5 to 30 percent

Bt horizons:
Hue—2.5YR or 5YR; value—4 or 5; chroma—3 or 6
Texture of the fine earth fraction—silt loam, silty clay loam, or clay loam
Content of rock fragments—5 to 30 percent
The horizon has redoximorphic features.

Btx horizon:
Hue—5YR or 7.5YR; value—4 or 5; chroma—4 to 6
Texture of the fine earth fraction—silt loam, silty clay loam, clay loam, or loam
Content of rock fragments—10 to 50 percent
The horizon has redoximorphic features.

Jugtown Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Flood plains
Parent material: Alluvium washed from soils derived from limestone, shale, and sandstone
Slope range: 0 to 3 percent
Associated soils: Lindside, Carbo, Hagerstown, Murrill, Nollville, Clarksburg, Penlaw, and Melvin
Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon

Jugtown silt loam, in an area of Jugtown-Lindside silt loams, in Ayr Township, Fulton County, 2 miles south of McConnellsburg, 1,200 feet west of intersection of US Route 522 and Pennsylvania Township Route T381, along Big Cove Creek; USGS Meadow Grounds topographic quadrangle; lat. 39 degrees 54 minutes 17 seconds N. and long. 78 degrees 0 minutes 55 seconds W.

Ap1—0 to 7 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; moderate fine and medium granular structure; friable, nonsticky and nonplastic; common very fine and fine roots; neutral; clear wavy boundary.

Ap2—7 to 12 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/4) silt loam; moderate medium granular and moderate fine and medium subangular blocky structure; friable, nonsticky and nonplastic; common very fine and fine roots; few fine and medium irregular very dark gray (10YR 3/1) dark concretions; neutral; clear wavy boundary.

BA—12 to 18 inches; brown (10YR 4/3) and yellowish brown (10YR 5/4) clay loam; yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky and nonplastic; common very fine and fine roots; few fine and medium irregular very dark gray (10YR 3/1) dark concretions; slightly alkaline; clear wavy boundary.

Bt1—18 to 26 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; common distinct clay films on faces of peds; common fine and medium irregular very dark gray (10YR 3/1) dark concretions; 1 percent gravel; slightly alkaline; gradual wavy boundary.

Bt2—26 to 38 inches; grayish brown (10YR 5/2) clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine roots; common distinct clay films on faces of peds; common medium irregular black (10YR 2/1) dark concretions; common fine and medium prominent yellowish brown (10YR 5/6) iron concentrations; 4 percent gravel; slightly alkaline; clear wavy boundary.

C—38 to 65 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam; massive; firm, slightly sticky and slightly plastic; few very fine roots; common medium prominent yellowish brown (10YR 5/8) iron concentrations and common medium distinct grayish brown (10YR 5/2) iron depletions; 60 percent gravel and cobbles; slightly alkaline.

Range in Characteristics

Thickness of the solum: 30 to 60 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: 15 to 30 percent
Content of rock fragments in the control section: Less than 15 percent
Kind of rock fragments: Chert, shale, and sandstone
Reaction: In unlimed areas slightly acid or neutral in the upper part of the solum and slightly acid to slightly alkaline in the lower part of the solum and in the substratum

A horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—1 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

BA horizon:
Hue—7.5YR or 10YR; value—3 to 6; chroma—3 to 6
Texture of the fine earth fraction—clay loam, silt loam, silty clay loam, or loam
Content of rock fragments—0 to 25 percent

Bt horizon:
Hue—7.5YR or 10YR; value—3 to 7; chroma—1 to 6
Texture of the fine earth fraction—clay loam, silt loam, silty clay loam, sandy clay loam, or loam
Content of rock fragments—0 to 25 percent
The horizon has redoximorphic features.

C horizon:
Hue—7.5YR or 10YR; value—2 to 6; chroma—1 to 6
Texture of the fine earth fraction—sandy clay loam, silty clay loam, silt loam, loam, sandy loam, or loamy sand
Content of rock fragments—5 to 75 percent
The horizon has redoximorphic features.

Klinesville Series

Depth to bedrock: Shallow
Drainage class: Somewhat excessively drained
Landform: Hills
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Slope range: 3 to 60 percent
Associated soils: Calvin, Leck kill, Hustontown, Weikert, Berks, Basher, and Barbour
Taxonomic class: Loamy-skeletal, mixed, mesic Lithic Dystrochrepts

Typical Pedon

Klinesville very channery silt loam, in an area of Klinesville and Weikert soils, 25 to 60 percent slopes, in Wells Township, Fulton County, 0.5 mile southwest of New Grenada, 0.5 mile southwest of intersection of Pennsylvania Routes 4013 and 0913, about 500 feet west of Route 4013; USGS Saltillo topographic quadrangle; lat. 40 degrees 7 minutes 48 seconds N. and long. 78 degrees 5 minutes 55 seconds W.

A—0 to 3 inches; reddish brown (5YR 4/3) very channery silt loam; weak fine and medium granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 35 percent angular shale channers; strongly acid; clear wavy boundary.

Bw1—3 to 8 inches; reddish brown (5YR 5/4) very channery silt loam; weak fine and medium subangular blocky structure; friable, nonsticky and nonplastic; many fine and medium roots; 40 percent angular shale channers; very strongly acid; clear wavy boundary.
Bw2—8 to 14 inches; reddish brown (5YR 4/4); extremely channery silt loam; weak medium subangular blocky structure; friable; nonsticky and nonplastic; common to many fine and medium roots; 60 percent angular shale channers; very strongly acid; abrupt wavy boundary.
R—14 inches; dark reddish brown (2.5YR 3/4) thin bedded acid shale bedrock; greater than 4 inches between fractures with little displacement of the pieces; bedrock inclination more than 30 degrees; faint clay and silt bridging between rock fragments.

Range in Characteristics

Thickness of the solum: 10 to 20 inches
Depth to bedrock: 10 to 20 inches
Content of clay in the control section: 10 to 20
Content of rock fragments in the control section: More than 35 percent
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas moderately acid to very strongly acid

A horizon:
Hue—2.5YR to 5YR; value—2 to 4; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 45 percent

B horizon:
Hue—2.5YR to 5YR; value—3 to 5; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—15 to 60 percent

C horizon (if it occurs):
Hue—2.5YR to 5YR; value—3 or 4; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—60 to 90 percent

Laidig Series

Depth to bedrock: Very deep; moderately deep or deep to a fragipan
Drainage class: Well drained
Landform: Mountain slopes and benches
Position on landform: Footslopes, toeslopes, and backslopes
Parent material: Colluvium derived from sandstone, siltstone, and shale
Slope range: 0 to 50 percent
Associated soils: Sideling, Dekalb, Hazleton, Buchanan, Andover, Bedington, Clymer, and Murrill
Taxonomic class: Fine-loamy, siliceous, mesic Typic Fragiudults

Typical Pedon

Laidig gravelly loam, 8 to 25 percent slopes, extremely stony, in Brush Creek Township, Fulton County, 3,500 feet north of intersection of Pennsylvania Routes 0030 and 0915, about 1,000 feet west of Route 0915; USGS Wells Tannery topographic quadrangle; lat. 40 degrees 1 minute 43 seconds N. and long. 78 degrees 9 minutes 43 seconds W.

Oe—0 to 1 inch; partly decomposed leaves and roots.
A—1 to 2 inches; very dark grayish brown (10YR 3/2) gravelly loam; weak fine and medium granular structure; loose, nonsticky and nonplastic; many fine to coarse roots; 15 percent subangular sandstone gravel and cobbles; very strongly acid; abrupt smooth boundary.
AE—2 to 5 inches; brown to dark brown (10YR 4/3) gravelly loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine to coarse roots; 15 percent subangular sandstone gravel and cobbles; very strongly acid; clear wavy boundary.
BE—5 to 13 inches; reddish yellow (7.5YR 6/6) gravelly loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; many fine roots; 20 percent subangular sandstone gravel and cobbles; very strongly acid; clear wavy boundary.
Bt1—13 to 27 inches; light brown (7.5YR 6/4) gravelly loam; weak medium subangular blocky structure; friable, nonsticky and nonplastic; few fine and medium roots; common faint clay films on faces of peds and in pores; 20 percent subangular sandstone gravel and cobbles; very strongly acid; gradual wavy boundary.
Bt2—27 to 36 inches; light brown (7.5YR 6/4) and strong brown (7.5YR 5/6) gravelly loam; moderate medium subangular blocky structure; firm, slightly sticky, nonplastic; few fine and medium roots; many faint clay films on faces of peds and in pores; common prominent black (10YR 2/1) iron-manganese stains on faces of peds; 25 percent subangular sandstone gravel and cobbles; very strongly acid; gradual wavy boundary.
Btx—36 to 65 inches; strong brown (7.5YR 5/6) gravelly loam; few medium prominent pinkish gray (7.5YR 7/2) iron depletions on surfaces of peds and few medium distinct reddish yellow (7.5YR 6/8) iron concentrations; moderate very coarse prismatic structure parting to moderate thick platy;

firm, brittle, nonsticky and nonplastic; few fine roots between prisms; few thin clay films on faces of peds; common prominent black (10YR 2/1) iron-manganese stains on faces of peds and lining pores; 30 percent subangular sandstone gravel and cobbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 50 to 80 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 30 to 50 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: Less than 35 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR; value—2 to 5; chroma—1 to 4
Texture of the fine earth fraction—loam
Content of rock fragments—10 to 45 percent

AE horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—1 to 6
Texture of the fine earth fraction—loam, sandy loam, or silt loam
Content of rock fragments—10 to 40 percent

BE horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 8
Texture of the fine earth fraction—loam, silt loam, or sandy loam
Content of rock fragments—5 to 40 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 8
Texture of the fine earth fraction—loam, silt loam, sandy clay loam, or clay loam
Content of rock fragments—5 to 40 percent in individual subhorizons

Bx horizon:
Hue—7.5YR to 10YR; value—4 to 6; chroma—3 to 8
Texture of the fine earth fraction—loam, sandy loam, sandy clay loam, or silt loam
Content of rock fragments—15 to 50 percent in individual subhorizons
In many pedons the horizon has redoximorphic features.

C horizon (if it occurs):
Hue—7.5YR or 10YR; value—5 or 6; chroma—3 to 8
Texture of the fine earth fraction—loam, sandy loam, sandy clay loam, or silt loam
Content of rock fragments—40 to 70 percent
In many pedons the horizon has redoximorphic features.

Leck Kill Series

Depth to bedrock: Deep
Drainage class: Well drained
Landform: Hills
Position on landform: Summits
Parent material: Residuum derived from acid, red shale, siltstone, and sandstone
Slope range: 0 to 50 percent
Associated soils: Calvin, Klinesville, Hustontown, Weikert, Berks, and Basher
Taxonomic class: Fine loamy, mixed, mesic, Typic Hapludults

Typical Pedon

Leck Kill channery silt loam, in an area of Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes, in Taylor Township, Fulton County, 0.5 mile north of Laidig, 1,500 feet northeast of intersection of Pennsylvania Route 4007 and Pennsylvania Township Route T 425, and 250 feet east of Route 4007; USGS Hustontown topographic quadrangle; lat. 40 degrees 2 minutes 9 seconds N. and long. 78 degrees 5 minutes 8 seconds W.

Ap—0 to 9 inches; reddish brown (5YR 4/3) channery silt loam; weak medium and fine granular structure; friable, nonsticky and nonplastic; many fine roots; 15 percent angular shale channers; slightly acid, abrupt wavy boundary.
Bt1—9 to 20 inches; yellowish red (5YR 5/6) channery silt loam; moderate medium to fine subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; common faint clay films on faces of peds and in pores; 25 percent angular shale channers; moderately acid; clear wavy boundary.
Bt2—20 to 30 inches; reddish brown (5YR 5/4) channery silt loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; few faint clay films on faces of peds; 30 percent angular shale channers; strongly acid; abrupt wavy boundary.
BC—30 to 45 inches; reddish brown (5YR 4/4) very channery silt loam; massive; firm, slightly sticky

and nonplastic; few prominent black (N 2/) iron-manganese coatings on channers; 55 percent angular shale channers; very strongly acid; gradual wavy boundary.

C—45 to 60 inches; reddish brown (5YR 4/4) extremely channery loam; massive; firm, nonsticky and nonplastic; 70 percent angular shale and siltstone channers with soil material between fractures; very strongly acid; clear wavy boundary.

R—60 inches; dusky red (10R 3/3) fractured shale bedrock; more than 4 inches between fractures; bedrock inclination more than 30 degrees; few faint clay and silt bridging between rock fragments.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Depth to bedrock: 40 to 60 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: 10 to 30 percent
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—5YR or 7.5YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

Bt horizon:
Hue—2.5YR or 5YR; value—3 to 5; chroma—4 to 6
Texture of the fine earth fraction—silt loam, loam, or silty clay loam
Content of rock fragments—10 to 40 percent in individual horizons

BC horizon:
Hue—2.5YR or 5YR; value—3 or 4; chroma—4 to 6
Texture of the fine earth fraction—silt loam, loam, or silty clay loam
Content of rock fragments—35 to 65 percent

C horizon:
Hue—10R to 5YR; value—3 or 4; chroma—4 to 6
Texture of the fine earth fraction—loam, silt loam, or silty clay loam
Content of rock fragments—60 to 80 percent

Lindside Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Flood plains
Parent material: Alluvium washed from soils derived from limestone and calcareous shale and sandstone
Slope range: 0 to 3 percent
Associated soils: Jugtown, Carbo, Melvin, Hagerstown, Murrill, Nollville, Wurno, Clarksburg, and Penlaw
Taxonomic class: Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts

Typical Pedon

Lindside silt loam, in an area of Jugtown-Lindside silt loams, in Ayr Township, Fulton County, 2 miles south of McConnellsburg along Big Cove Creek, 1,300 feet west of intersection of U.S. Route 522 and Pennsylvania Township Route T381; USGS Meadow Grounds topographic quadrangle; lat. 39 degrees 54 minutes 11 seconds N. and long. 78 degrees 1 minute 1 second W.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; moderate fine and medium granular structure; friable, nonsticky, nonplastic; many fine and medium roots; neutral; abrupt smooth boundary.

BA—8 to 18 inches; dark yellowish brown (10YR 4/4), brown (10YR 5/3) and yellowish brown (10YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; neutral; clear wavy boundary.

Bw1—18 to 26 inches; yellowish brown (10YR 5/4) silt loam; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium prominent light brownish gray (10YR 6/2) iron depletions and strong brown (7.5YR 5/6) iron concentrations; neutral; clear wavy boundary.

Bw2—26 to 32 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium prominent light brownish gray (10YR 6/2) iron depletions and yellowish brown (10YR 5/8) iron concentrations; neutral; gradual wavy boundary.

Bw3—32 to 40 inches; brown to dark brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; very few fine roots; common fine and medium prominent light gray (10YR 7/2) iron depletions and yellowish brown (10YR 5/8) iron concentrations; few fine rounded black (10YR 2/1) iron-manganese concretions; 5 percent rounded sandstone chert pebbles; neutral; gradual wavy boundary.

BC—40 to 48 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable, nonsticky

and nonplastic; very few fine roots; common fine and medium prominent light gray (10YR 7/2) iron depletions and yellowish brown (10YR 5/8) iron concentrations; few fine rounded black (10YR 2/1) iron-manganese concretions; 10 percent rounded sandstone and chert pebbles; neutral; clear wavy boundary.

C—48 to 65 inches; stratified light brownish gray (10YR 6/2) and brown (10YR 5/3) gravelly sandy loam and light gray (10YR 7/2) clay loam; massive; friable, slightly sticky and slightly plastic; very few fine roots; many medium prominent light brownish yellow (10YR 6/8) iron masses; 30 percent rounded sandstone and chert pebbles; neutral.

Range in Characteristics

Thickness of the solum: 25 to 50 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: Less than 15 percent
Kind of rock fragments: Limestone, chert, and sandstone
Reaction: In unlimed areas strongly acid to slightly alkaline in the upper part and moderately acid to slightly alkaline in the lower part

A horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 5 percent

BA or Bw horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—2 to 6
Texture of the fine earth fraction—silt loam, loam, fine sandy loam, or silty clay loam
Content of rock fragments—0 to 10 percent
The horizon has redoximorphic features.

C horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—1 to 4
Texture of the fine earth fraction—sandy loam, clay loam, silt loam, sandy clay loam, or loam
Content of rock fragments—0 to 30 percent
The horizon has redoximorphic features.

Melvin Series

Depth to bedrock: Very deep
Drainage class: Poorly drained
Landform: Flood plains
Parent material: Stratified alluvium derived from soils underlain by limestone and calcareous shale on uplands
Slope range: 0 to 3 percent
Associated soils: Lindside, Clarksburg, Penlaw, and Murrill
Taxonomic class: Fine-silty, mixed, nonacid, mesic Typic Fluvaquents

Typical Pedon

Melvin silt loam, in Quincy Township, Franklin County, 1,300 feet northwest of intersection of Pennsylvania Routes 0316 and 2016; USGS Waynesboro topographic quadrangle; lat. 39 degrees 48 minutes 23 seconds N. and long. 77 degrees 36 minutes 42 seconds W.

Ap1—0 to 2 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; neutral; clear wavy boundary.

Ap2—2 to 10 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; few fine prominent dark brown (7.5YR 4/4) iron concentrations; neutral; clear wavy boundary.

Bg1—10 to 22 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common medium distinct dark brown (10YR 4/3) iron concentrations and along pores; neutral; clear wavy boundary.

Bg2—22 to 36 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few sandy loam lenses; common medium distinct dark brown (10YR 4/3) iron concentrations; neutral; clear wavy boundary.

Cg1—36 to 62 inches; dark grayish brown (2.5Y 4/2) silt loam; massive; friable, slightly sticky and nonplastic; prominent black (10YR 2/1) stains on sand and pebbles; common medium prominent dark gray (10YR 4/1) iron depletions and common medium prominent dark yellowish brown (10YR 4/4) iron concentrations; 5 percent rounded chert and sandstone pebbles; neutral; gradual wavy boundary.

Cg2—62 to 68 inches; variegated dark gray (5Y 4/1) and dark gray (N 4/) sandy loam; massive; friable, nonsticky and nonplastic; prominent black (5Y 2/1) stains on sand and pebbles; 5 percent rounded chert and sandstone pebbles and cobbles; neutral; abrupt wavy boundary.

Cg3—68 to 72 inches; variegated dark grayish brown (2.5Y 4/2) and dark gray (5Y 4/1) stratified silt and sand; massive; friable, nonsticky and nonplastic; 5

percent rounded chert and sandstone pebbles and cobbles; neutral.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: More than 60 inches
Depth to iron depletions that have chroma of 2 or less: 0 to 10 inches
Organic matter content: Irregular decreases with depth
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: Less than 5 percent
Kind of rock fragments: Limestone, chert, and sandstone
Reaction: In unlimed areas moderately acid to slightly alkaline

A horizon:
Hue—10YR to 5Y; value—4 to 7; chroma—1 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 5 percent
The horizon has redoximorphic features.

Bg horizon:
Hue—10YR to N; value—4 to 7; chroma—2 to 0
Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—0 to 5 percent to a depth of 30 inches and 0 to 20 percent below
The horizon has redoximorphic features.

Cg horizon:
Hue—10YR to 5Y; value—4 to 7; chroma—2 to 0
Texture of the fine earth fraction—silt loam, silty clay loam, loam, or, in some pedons, stratified layers of sand and gravel
Content of rock fragments—0 to 20 percent
The horizon has redoximorphic features.

Monongahela Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Moderately well drained
Landform: Terraces
Parent material: Old alluvium washed from soils on uplands underlain by acid sandstone and shale
Slope range: 3 to 8 percent
Associated soils: Tyler, Purdy, Allegheny, Pope, Philo, Basher, and Atkins
Taxonomic class: Fine-loamy, mixed, mesic Typic Fragiudults

Typical Pedon

Monongahela silt loam, 3 to 8 percent slopes, in Antrim Township, Franklin County, 2 miles southeast of Williamson, 3,000 feet northwest of intersection of Pennsylvania Township Route T 340 and Pennsylvania Route T 423; USGS Williamson topographic quadrangle; lat. 39 degrees 49 minutes 36 seconds N. and long 77 degrees 47 minutes 18 seconds W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; many fine and medium roots; 5 percent subrounded sandstone and siltstone pebbles; neutral; clear smooth boundary.

Bt1—7 to 17 inches; yellowish brown (10YR 5/8) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few distinct clay films on faces of peds and in pores; common fine and medium roots; 5 percent subrounded sandstone and siltstone pebbles; slightly acid; gradual wavy boundary.

Bt2—17 to 22 inches; yellowish brown (10YR 5/8) silty clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; few distinct clay films on faces of peds and in pores; few fine roots; common medium prominent very pale brown (10YR 7/4) iron concentrations; few medium prominent grayish brown (10YR 5/2) iron depletions along faces of peds; 5 percent subrounded sandstone and siltstone pebbles; moderately acid; gradual wavy boundary.

Btx1—22 to 45 inches; yellowish brown (10YR 5/6) silt loam; strong very coarse prismatic structure parting to moderate medium platy; firm, brittle, sticky and plastic; many distinct clay films on faces of peds; few fine roots between prisms; common medium distinct brown (10YR 5/3) iron depletions; common coarse prominent light brownish gray (10YR 6/2) iron depletions along faces of peds; 5 percent subrounded sandstone and siltstone pebbles; strongly acid; gradual wavy boundary.

Btx2—45 to 55 inches; light yellowish brown (10YR 6/4) clay loam; strong very coarse prismatic structure parting to moderate medium platy; firm, brittle, sticky and plastic; many distinct clay films on faces of peds; common coarse distinct yellowish brown (10YR 5/6) iron concentrations and light brownish gray (10YR 6/2) iron depletions along faces of peds; 5 percent subrounded sandstone and siltstone pebbles; strongly acid; gradual wavy boundary.

2C—55 to 66 inches, grayish brown (2.5Y 5/2) clay loam; common medium prominent brownish yellow (10YR 6/6) iron concentrations; massive; firm, sticky and plastic; 15 percent subrounded

sandstone and siltstone pebbles and cobbles; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 70 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 20 to 30 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: 0 to 30 percent
Kind of rock fragments: Sandstone and shale
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—10YR; value—4 or 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

Bt horizon:
Hue—10YR or 7.5YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam, silty clay loam, loam, clay loam, or sandy clay loam
Content of rock fragments—0 to 30 percent
The horizon has redoximorphic features.

Btx horizon:
Hue—7.5YR to 2.5Y; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam, clay loam, loam, sandy clay loam, or fine sandy loam
Content of rock fragments—0 to 35 percent
The horizon has redoximorphic features.

C horizon:
Hue—7.5YR to 2.5Y; value—4 to 7; chroma—2 to 8
Texture of the fine earth fraction—clay loam, sandy loam, loam, or silt loam
Content of rock fragments—10 to 40 percent
The horizon has redoximorphic features.

Murrill Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Uplands in the limestone valley
Position on landform: Toeslopes, footslopes, and colluvial fans
Parent material: Colluvium that was derived from sandstone, siltstone, and shale and that was deposited over limestone
Slope range: 3 to 25 percent
Associated soils: Carbo, Hagerstown, Clarksburg, Penlaw, Laidig, Buchanan, Nollville, Elliber, Frankstown, Lindside, and Melvin
Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludults

Typical Pedon

Murrill gravelly loam, 3 to 8 percent slopes, in St. Thomas Township, Franklin County, 1 mile northeast of Edenville, 800 feet northeast of intersection of Pennsylvania Route 4008 and Pennsylvania Township Route T479; USGS St. Thomas topographic quadrangle; lat. 39 degrees 58 minutes 0 seconds N. and long. 77 degrees 47 minutes 42 seconds W.

Ap—0 to 9 inches; dark brown (10YR 3/3) gravelly loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; 15 percent subrounded sandstone and shale gravel; neutral; abrupt, smooth boundary.
BE—9 to 14 inches; yellowish-brown (10YR 5/4) gravelly loam; moderate, medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; 15 percent subrounded sandstone and shale gravel; slightly acid; clear, wavy boundary.
Bt1—14 to 24 inches; brown (7.5YR 5/4) gravelly clay loam; moderate, medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common distinct clay films on faces of peds and in pores; 15 percent subrounded sandstone and shale gravel; moderately acid; clear, wavy boundary.
Bt2—24 to 55 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; few fine and medium roots; common distinct clay films on faces of peds and in pores; 10 percent subrounded sandstone and shale gravel; strongly acid; clear wavy boundary.
2Bt—55 to 70 inches; yellowish red (5YR 5/8) silty clay; medium and coarse prominent red (2.5YR 4/6) mottles; moderate, medium, blocky structure; firm, sticky and plastic; few distinct clay films on faces of peds and in pores; 5 percent subrounded sandstone and shale gravel; strongly acid.

Range in Characteristics

Thickness of the solum: More than 60 inches.
Depth to bedrock: More than 60 inches.
Depth to lithologic discontinuity: 30 to 100 inches
Content of clay in the control section: 25 to 34 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Siltstone, chert, limestone, shale, and sandstone

Reaction: In unlimed areas moderately acid to very strongly acid

Ap horizon:
Hue—10YR; value—3 or 4; chroma—2 to 4
Texture of the fine earth fraction—loam
Content of rock fragments—15 to 30 percent

BE horizon:
Hue—10YR or 7.5YR; value—5 or 6; chroma—3 to 6
Texture of the fine earth fraction—loam, sandy loam, or silt loam
Content of rock fragments—10 to 30 percent

Bt horizon:
Hue—10YR to 5YR; value—4 to 6; chroma—4 to 6
Texture of the fine earth—clay loam, sandy clay loam, silty clay loam, silt loam, or loam
Content of rock fragments—5 to 35 percent

2Bt horizon:
Hue—2.5YR to 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth—silty clay loam, silty clay, or clay loam
Content of rock fragments—0 to 40 percent

Nollville Series

Depth to bedrock: Deep
Drainage class: Well drained
Landform: Ridges and hills in the limestone valley
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from thin-bedded, calcareous shale and limestone
Slope range: 3 to 25 percent
Associated soils: Wurno, Murrill, Clarksburg, Penlaw, and Elliber
Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Nollville channery silt loam, in an area of Ryder-Nollville channery silt loams, 8 to 15 percent slopes, in Washington Township, Franklin County, 0.75 mile south of Waynesboro; about 4,000 feet northeast of intersection of Pennsylvania Route 316 and Pennsylvania Township Route T363, about 1,400 feet north of Pennsylvania Township Route T363; USGS Smithsburg topographic quadrangle; lat. 39 degrees 43 minutes 50 seconds N. and long. 77 degrees 35 minutes 38 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) channery silt loam; moderate fine and medium granular structure; friable, nonsticky and nonplastic; common very fine and fine roots; 15 percent angular calcareous shale channers; neutral; abrupt smooth boundary.

Bt1—9 to 18 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable, slightly sticky and nonplastic; common fine and medium roots; common distinct clay films on faces of peds and in pores; 10 percent angular calcareous shale channers; neutral; clear wavy boundary.

Bt2—18 to 26 inches; yellowish brown (10YR 5/6) channery silt loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common distinct clay films on faces of peds and in pores; 15 percent angular calcareous shale channers; slightly acid; gradual wavy boundary.

Bt3—26 to 40 inches; strong brown (7.5YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; firm, sticky and slightly plastic; common fine and medium roots; common faint clay films on faces of peds and in pores; 25 percent angular calcareous shale channers; neutral; gradual wavy boundary.

C—40 to 58 inches; brownish yellow (10YR 6/6) very channery silty clay loam; massive; firm, sticky and slightly plastic; few fine and medium roots; 60 percent angular calcareous shale channers; neutral; clear irregular boundary.

R—58 inches; moderately weathered, thin-bedded, calcareous shale inclined more than 30 degrees; more than 4 inches between fractures.

Range in Characteristics

Thickness of the solum: 25 to 55 inches
Depth to bedrock: 40 to 60 inches
Content of clay in the control section: 20 to 34 percent
Content of rock fragments in the control section: Less than 30 percent
Kind of rock fragments: Shale-calcareous
Reaction: In unlimed areas slightly acid or neutral in the upper part of the solum and slightly acid to slightly alkaline in the lower part of the solum and in the substratum

Ap horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 25 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8

Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—5 to 40 percent in individual horizons

C horizon:
Hue—7.5YR to 10YR; value—5 or 6; chroma—4 or 8
Texture of the fine earth fraction—silty clay loam, silt loam, or silty clay
Content of rock fragments—25 to 70 percent

Pecktonville Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Ridges in the limestone valley
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from limestone rock containing chert
Slope range: 3 to 45 percent
Associated soils: Wurno, Nollville, Frankstown, and Elliber
Taxonomic class: Clayey, mixed, mesic, Typic Paleudults

Typical Pedon

Pecktonville gravelly silt loam, 8 to 15 percent slopes, in Washington County, Maryland, 1.25 miles south of Pennsylvania State line, 500 feet west of Indian Springs Road; USGS Cherry Run topographic quadrangle; lat. 41 degrees 43 minutes 59 seconds N. and long. 78 degrees 1 minute 57 seconds W.

Ap1—0 to 7 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine roots; 30 percent rock fragments; strongly acid; abrupt smooth boundary.
Ap2—7 to 11 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; weak medium platy structure; friable, nonsticky and nonplastic; many fine roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary.
Bt1—11 to 23 inches; yellowish red (5YR 4/6) silty clay; moderate medium subangular blocky structure; firm, slightly sticky and plastic; few fine roots; common distinct clay films on faces of peds; 7 percent rock fragments; moderately acid; clear smooth boundary.
Bt2—23 to 32 inches; yellowish red (5YR 4/6) channery silty clay; weak medium angular blocky structure; firm, sticky and plastic; few fine roots; common distinct clay films on faces of peds; 30 percent rock fragments; slightly acid; abrupt smooth boundary.
Bt3—32 to 48 inches; red (2.5YR 4/6) clay; many distinct brownish yellow (10YR 6/6) mottles inherited from shale fragments; weak very fine angular blocky structure; very firm, slightly sticky and plastic; few fine roots; many distinct clay films on faces of peds; 10 percent rock fragments; moderately acid; clear smooth boundary.
Bt4—48 to 63 inches; red (2.5YR 4/6) silty clay; weak very fine angular blocky structure; very firm; slightly sticky and plastic; few fine roots; many distinct clay films on faces of peds; common fine prominent grayish brown (10YR 5/2) iron depletions, many medium prominent brownish yellow (10YR 6/6) iron concentrations; 5 percent rock fragments; moderately acid; clear smooth boundary.
BC—63 to 75 inches; yellowish brown (10YR 5/8) and yellowish red (5YR 4/6) clay loam; moderate fine platy structure; friable; few distinct clay films on faces of peds; moderately acid.

Range in Characteristics

Thickness of the solum: 60 to 70 inches
Depth to bedrock: More than 72 inches
Content of clay in the control section: More than 35 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Chert, shale, and sandstone
Reaction: In unlimed areas moderately acid to very strongly acid

A horizon:
Hue—7.5YR to 10YR; value—3 to 5; chroma—3 to 6
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

BE horizon:
Hue—7.5YR to 10YR; value—4 to 6; chroma—4 to 6
Texture of the fine earth fraction—loam, silt loam, or silty clay loam
Content of rock fragments—5 to 60 percent

Bt horizon:
Hue—2.5YR to 5YR; value—4 to 6; chroma—6 to 8
Texture of the fine earth fraction—silty clay loam, clay loam, silty clay, or clay
Content of rock fragments—0 to 30 percent

BC horizon:
Hue—2.5YR or 10YR; value—4 to 6; chroma—6 to 8
Texture of the fine earth fraction—clay, silty clay loam, or silty clay
Content of rock fragments—0 to 25 percent

C horizon:
Hue—10YR to 5Y; value—4 to 7; chroma—1 to 4
Texture of the fine earth fraction—silty clay loam or silt loam
Content of rock fragments—50 to 90 percent

Penlaw Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Somewhat poorly drained
Landform: Uplands in the limestone valley
Position on landform: Toeslopes
Parent material: Colluvium derived from limestone, calcareous and noncalcareous shale, and sandstone
Slope range: 0 to 3 percent
Associated soils: Clarksburg, Murrill, Hagerstown, Nollville, Lindside, Melvin, and Carbo
Taxonomic class: Fine-silty, mixed, mesic Aquic Fragiudalfs

Typical Pedon

Penlaw silt loam, 0 to 3 percent slopes, in Peters Township, Franklin county, 1.7 miles south of Lemasters, 1,200 feet northeast of intersection of Pennsylvania Township Routes T332 and T328, about 900 feet east of T332; USGS Williamson topographic quadrangle; lat. 39 degrees 50 minutes 7 seconds N. and long. 77 degrees 51 minutes 30 seconds W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; slightly acid; abrupt smooth boundary.
Bt—10 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium blocky structure; firm, slightly sticky and plastic; few fine and medium roots; common faint brown (10YR 5/3) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions on surfaces of peds; neutral; clear wavy boundary.
Btx1—23 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; weak very coarse prismatic structure parting to moderate medium platy: firm, brittle, slightly sticky and plastic; many distinct brown (7.5YR 5/4) clay films; few prominent black (N 2/) iron-manganese coatings on faces of plates; many medium distinct brown (10YR 5/3) and many medium prominent light gray (10YR 7/1) iron depletions on surfaces of peds; neutral; gradual wavy boundary.
Btx2—35 to 50 inches; yellowish brown (10YR 5/6) silty clay loam; weak very coarse prismatic structure parting to moderate medium blocky and medium platy; firm, brittle, slightly sticky and plastic; common faint clay films on faces of peds; few prominent black (N 2/) iron-manganese coatings on faces of peds; many medium prominent light brownish gray (10YR 6/2) iron depletions on surfaces of peds; many medium faint strong brown (7.5YR 5/6) iron concentrations; neutral; gradual wavy boundary.
BC—50 to 65 inches; brown (10YR 4/3) silty clay; moderate medium blocky structure; firm, sticky and plastic; common medium distinct yellowish brown (10YR 5/6) iron concentrations; common medium distinct grayish brown (10YR 5/2) iron depletions; 5 percent subrounded limestone and chert channers; neutral.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 15 to 30 inches
Content of clay in the control section: 20 to 34 percent
Content of rock fragments in the control section: Less than 15 percent
Kind of rock fragments: Chert, limestone, shale, and sandstone
Reaction: In unlimed areas moderately acid to neutral

Ap horizon:
Hue—10YR or 2.5Y; value—4 or 5; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 10 percent

Bt horizon:
Hue—7.5YR or 10YR; value—5 or 6; chroma—4 to 8
Texture of the fine earth fraction—silty clay loam or silt loam
Content of rock fragments—0 to 10 percent
The horizon has redoximorphic features.

Btx horizon:
Hue—7.5YR or 10YR; value—5 or 6; chroma—4 to 8
Texture of the fine earth fraction—silty clay loam, clay loam, or silt loam
Content of rock fragments—0 to 25 percent
The horizon has redoximorphic features.

BC horizon:
Hue—5YR to 10YR; value—2 to 6; chroma—2 to 8
Texture of the fine earth fraction—silty clay, loam, or clay loam
Content of rock fragments—0 to 25 percent
The horizon has redoximorphic features.

Philo Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Flood plains
Parent material: Alluvium washed from soils on uplands underlain by acid shale, siltstone, and sandstone
Slope range: 0 to 3 percent
Associated soils: Pope, Atkins, Allegheny, Monongahela, Tyler, Purdy, Ernest, Brinkerton, Berks, and Weikert
Taxonomic class: Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts

Typical Pedon

Philo silt loam, in Montgomery Township, in Franklin County, 2 miles southeast of Mercersburg, along west branch of Conococheague Creek, 4,000 feet southwest of intersection of Pennsylvania Township Route T332 and T333, about 2,000 feet west of T332; USGS Williamson topographic quadrangle; lat. 39 degrees 49 minutes 30 seconds N. and long. 77 degrees 52 minutes 27 seconds W.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; loose, nonsticky and nonplastic; many fine and medium roots; slightly acid; clear smooth boundary.
A2—3 to 9 inches; dark brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable, nonsticky and nonplastic; many fine and medium roots; slightly acid; clear wavy boundary.
Bw1—9 to 17 inches; yellowish brown (10YR 5/6) silt loam; moderate medium granular structure; friable, slightly sticky and nonplastic; common fine roots; moderately acid; clear wavy boundary.
Bw2—17 to 29 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; few fine roots; common medium prominent strong brown (7.5YR 5/8) iron concentrations; common medium distinct grayish brown (10YR 5/2) iron depletions on surfaces of peds; moderately acid; gradual wavy boundary.
C—29 to 48 inches; dark grayish brown (10YR 4/2) fine sandy loam; massive; friable, nonsticky and nonplastic; few fine roots; common coarse prominent strong brown (7.5YR 5/8) iron concentrations; medium faint grayish brown (10YR 5/2) iron depletions; strongly acid; gradual wavy boundary.
2C—48 to 65 inches; dark grayish brown (10YR 4/2) stratified gravelly sand and loam; massive; friable, nonsticky and nonplastic; 20 percent pebbles; strongly acid.

Range in Characteristics

Thickness of the solum: 20 to 48 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: 10 to 18 percent
Content of rock fragments in the control section: 0 to 20 percent
Kind of rock fragments: Sandstone, siltstone, or shale
Reaction: In unlimed areas moderately acid to very strongly acid

A horizon:
Hue—7.5YR or 10YR; value—3 or 4; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

B horizon:
Hue—7.5YR or 10YR; value—3 to 6; chroma—3 to 6
Texture of the fine earth fraction—silt loam, loam, or sandy loam
Content of rock fragments—0 to 20 percent
The horizon has redoximorphic features.

C horizon:
Hue—7.5YR to 2.5Y or neutral; value—4 to 6; chroma—0 to 2
Texture of the fine earth fraction—sand to silt loam
Content of rock fragments—0 to 20 percent in the upper part of the horizon and 0 to 40 percent in the lower part
The horizon has redoximorphic features.

Pope Series

Depth to bedrock: Very deep
Drainage class: Well drained
Landform: Flood plains
Parent material: Alluvium washed from soils on uplands underlain by acid sandstone, siltstone, and shale
Slope range: 0 to 3 percent

Associated soils: Philo, Atkins, Allegheny, Monongahela, Ernest, Berks, and Weikert
Taxonomic class: Coarse-loamy, mixed, mesic Fluventic Dystrochrepts

Typical Pedon

Pope silt loam, in Thompson Township, Fulton County, 0.7 mile north of intersection of Pennsylvania Route 0655 and Pennsylvania Township Route T347, about 900 feet east of Route 0655; USGS Needmore topographic quadrangle; lat. 39 degrees 49 minutes 21 seconds N. and long. 78 degrees 8 minutes 30 seconds W.

A—0 to 10 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine roots; slightly acid, clear wavy boundary.
Bw1—10 to 20 inches; yellowish brown (10YR 5/4) loam; weak fine granular structure; very friable, nonsticky and nonplastic; common fine roots; strongly acid; gradual wavy boundary.
Bw2—20 to 40 inches; brown (7.5YR 5/4) sandy loam; massive; very friable, nonsticky and nonplastic; few fine roots; strongly acid; gradual wavy boundary.
C—40 to 60 inches; strong brown (7.5YR 5/6) loamy sand; massive; very friable, nonsticky and nonplastic; very few fine roots; 5 percent pebbles and cobbles; strongly acid.

Range in Characteristics

Thickness of the solum: 30 to 60 inches
Depth to bedrock: More than 60 inches
Organic carbon content: More than 0.2 percent at a depth of 50 inches
Content of clay in the control section: Less than 18 percent
Content of rock fragments in the control section: Less than 35 percent
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR; value—4 or 5; chroma—3 or 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 15 percent

B horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—loam, sandy loam, or fine sandy loam
Content of rock fragments—0 to 30 percent

C horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—loamy sand, loam, or sandy loam
Content of rock fragments—0 to 30 percent to a depth of 40 inches and 0 to 65 percent below

Purdy Series

Depth to bedrock: Very deep
Drainage class: Poorly drained
Landform: Terraces
Parent material: Alluvium washed from soils on uplands underlain by shale and siltstone
Slope range: 0 to 3 percent
Associated soils: Monongahela, Tyler, Brinkerton, and Philo
Taxonomic class: Clayey, mixed, mesic Typic Endoaquults

Typical Pedon

Purdy silty clay loam, in Metal Township, Franklin County, 1 mile south of Fannettsburg near Cononocheague Creek, 3,200 feet east of intersection of Pennsylvania Route 0075 and Pennsylvania Township Route T576; USGS Fannettsburg topographic quadrangle; lat. 40 degrees 2 minutes 59 seconds N. and long. 77 degrees 50 minutes 0 seconds W.

A1—0 to 2 inches; black (10YR 2/1) silty clay loam; weak medium granular structure; friable, nonsticky and nonplastic; many fine and medium roots; strongly acid; clear wavy boundary.
A2—2 to 7 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine and medium roots; common fine faint light brownish gray (10YR 6/2) and light gray (10YR 7/2) iron depletions on surfaces of peds; very strongly acid; clear wavy boundary.
Btg1—7 to 10 inches; grayish brown (10YR 5/2) silty clay; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots; few distinct clay films on faces of peds; common medium distinct white (10YR 8/2) iron depletions on surfaces of peds; common medium prominent brownish yellow (10YR 6/8) and yellowish brown (10YR 5/6) iron concentrations; strongly acid; clear wavy boundary.
Btg2—10 to 28 inches; grayish brown (10YR 5/2) silty clay; strong medium subangular blocky structure;

firm, moderately sticky, moderately plastic; few fine roots; common prominent clay films on faces of peds; common medium distinct white (10YR 8/2) iron depletions on surfaces of peds; common medium prominent brownish yellow (10YR 6/8) iron concentrations; very strongly acid; clear wavy boundary.

Btg3—28 to 40 inches; grayish brown (10YR 5/2) silty clay; strong medium blocky structure; very firm, moderately sticky, moderately plastic; few fine roots; common prominent clay films on faces of peds; few fine distinct white (10YR 8/2) iron depletions on surfaces of peds; few fine prominent brownish yellow (10YR 6/8) iron concentrations; very strongly acid; clear wavy boundary.

Cg1—40 to 60 inches; light brownish gray (10YR 6/2) silty clay; massive; firm, slightly sticky and slightly plastic; common fine distinct light yellowish brown (10YR 6/4) and common fine prominent brown to dark brown (7.5YR 4/4) iron concentrations; 5 percent subrounded shale and sandstone pebbles; very strongly acid; clear irregular boundary.

Cg2—60 to 65 inches; light brownish gray (10YR 6/2) silty clay; massive; firm, slightly sticky and slightly plastic; few fine faint white (10YR 8/2) iron depletions along channels; few fine prominent yellowish brown (10YR 5/6) iron concentrations; 10 percent subrounded shale and sandstone pebbles; very strongly acid.

Range in Characteristics

Thickness of the solum: 28 to 50 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 35 to 50 percent
Content of rock fragments in the control section: Less than 10 percent
Kind of rock fragments: Shale and sandstone
Reaction: In unlimed areas strongly acid to extremely acid

A horizon:
Hue—10YR or 2.5Y; value—2 to 5; chroma—0 to 2
Texture of the fine earth fraction—silty clay loam
Content of rock fragments—0 to 10 percent
The horizon has redoximorphic features.

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral; value—4 or 5; chroma—0 to 2
Texture of the fine earth fraction—silty clay, silty clay loam, or clay
Content of rock fragments—0 to 10 percent

Cg horizon:
Hue—10YR to 5Y or neutral; value—4 to 6; chroma—0 to 3
Texture of the fine earth fraction—silty clay, silty clay loam, or clay loam
Content of rock fragments—0 to 30 percent
The horizon has redoximorphic features.

Sideling Series

Depth to bedrock: Very deep
Drainage class: Moderately well drained
Landform: Mountain slopes
Position on landform: Toeslopes, footslopes, and backslopes
Parent material: Colluvium derived from sandstone, siltstone, and shale
Slope range: 0 to 45 percent
Associated soils: Laidig, Dekalb, Hazleton, Buchanan, and Andover
Taxonomic class: Fine-loamy, siliceous, mesic Oxyaquic Hapludults

Typical Pedon

Sideling gravelly loam, 8 to 25 percent slopes, extremely stony, in St. Thomas Township, Franklin County, 1.2 miles southwest of Franklin Furnace, in McCasslin Valley, 0.75 mile southwest of State Game Lands parking lot, 1.2 miles southwest of intersection of Pennsylvania Township Routes T476 and T474; St. Thomas USGS topographic quadrangle; lat. 39 degrees 56 minutes 47 seconds N. and long. 77 degrees 50 minutes 20 seconds W.

Oi—0 to 1 inch; slightly decomposed mat of roots and leaves.

Oa—1 to 2 inches; highly decomposed organic materials containing twigs and roots.

A—2 to 5 inches; dark brown (10YR 3/3) gravelly loam; weak fine and medium granular structure; very friable, nonsticky and nonplastic; many very fine to medium roots; 20 percent subrounded and subangular sandstone-shale gravel; very strongly acid; clear smooth boundary.

BE—5 to 9 inches; brownish yellow (10YR 6/6) gravelly loam; weak and moderate fine and medium subangular blocky structure; friable, nonsticky and nonplastic; common very fine to coarse roots; 30 percent subrounded and subangular sandstone-shale gravel and cobbles; very strongly acid; gradual smooth boundary.

Bt1—9 to 19 inches; reddish yellow (7.5YR 6/6) gravelly clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine to medium roots; common distinct clay films on faces of peds and in pores; 30 percent subrounded and subangular

sandstone-shale gravel and cobbles; very strongly acid; gradual wavy boundary.

Bt2—19 to 30 inches; light brown (7.5YR 6/4) gravelly silt loam; moderate and strong medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine to coarse roots; common distinct clay films on faces of peds and in pores; 30 percent subrounded and subangular sandstone-shale gravel and cobbles; very strongly acid; gradual wavy boundary.

Bt3—30 to 38 inches; light brown (7.5YR 6/4) gravelly silt loam; moderate and strong medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine to coarse roots; common distinct clay films on faces of peds and in pores; 30 percent subrounded and subangular sandstone-shale gravel and cobbles; very strongly acid; gradual irregular boundary.

2Bt1—38 to 43 inches; light brown (7.5YR 6/4) gravelly silt loam; weak and moderate fine and medium platy and weak and moderate fine and medium subangular blocky structure; firm, slightly sticky and slightly plastic; common very fine to coarse roots; common distinct clay films on faces of peds and in pores; common fine and medium prominent pink (7.5YR 7/4) iron concentrations and common fine and medium prominent pinkish gray (5YR 7/2) iron depletions; 35 percent subangular sandstone-shale gravel and cobbles; very strongly acid; gradual irregular boundary.

2Bt2—43 to 58 inches; light brown (7.5YR 6/4) and brown (7.5YR 5/4) channery clay loam; moderate medium platy and moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; very few prominent black (7.5YR 2/1) stains on faces of peds and very few prominent black (7.5YR 2/1) stains on rock fragments and common distinct clay films on faces of peds and in pores; common fine and medium distinct pink (7.5YR 7/4) and reddish yellow (5YR 6/6) iron concentrations; common fine and medium prominent pinkish gray (5YR 7/2) iron depletions; 35 percent subangular and angular sandstone-shale channers; very strongly acid; clear wavy boundary.

2BC—58 to 65 inches; reddish brown (5YR 5/4) and yellowish red (5YR 5/6) extremely channery clay loam; weak and moderate medium and coarse subangular blocky structure; firm, sticky and plastic; few prominent dark reddish brown (5YR 3/2) stains on faces of peds and few prominent dark reddish brown (5YR 3/2) stains on rock fragments; common fine and medium prominent pink (7.5YR 7/4) iron concentrations; common fine and medium prominent pinkish gray (5YR 7/2) iron depletions; 60 percent subangular and angular shale-siltstone channers; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 65 inches
Depth to bedrock: More than 60 inches
Content of clay in the control section: 18 to 30 percent
Content of rock fragments in the control section: Less than 35 percent
Size of rock fragments: Gravel to boulders
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: Moderately acid to very strongly acid

A horizon:
Hue—10YR; value—2 to 4; chroma—1 to 4
Texture of the fine earth fraction—loam
Content of rock fragments—15 to 65 percent

E horizon (where it occurs):
Hue—10YR or 2.5Y; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—loam, fine sandy loam, or sandy loam
Content of rock fragments—10 to 40 percent

BE horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—loam, fine sandy loam, or sandy loam
Content of rock fragments—10 to 40 percent

Bt horizon:
Hue—7.5YR or 10YR; value—4 to 8; chroma—4 to 8
Texture of the fine earth fraction—loam, silt loam, sandy clay loam, or clay loam
Content of rock fragments—10 to 40 percent

2Bt horizon:
Hue—5YR to 10YR; value—4 to 8; chroma—4 to 8
Texture of the fine earth fraction—loam, silt loam, clay loam, sandy clay loam, or silty clay loam
Content of rock fragments—10 to 40 percent
The horizon has redoximorphic features.

2BC horizon:
Hue—5YR to 10YR; value—5 to 8; chroma—3 to 8
Texture of the fine earth fraction—loam, clay loam, silty clay loam, or silt loam
Content of rock fragments—40 to 70 percent
The horizon has redoximorphic features.

Tyler Series

Depth to bedrock: Very deep; moderately deep to a fragipan
Drainage class: Somewhat poorly drained
Landform: Terraces
Parent material: Old alluvium derived from soils on uplands underlain by acid sandstone and shale
Slope range: 0 to 3 percent
Associated soils: Purdy, Monongahela, and Philo
Taxonomic class: Fine-silty, mixed, mesic Aeric Fragiaquults

Typical Pedon

Tyler silt loam, 0 to 3 percent slopes, in Lurgan Township, Franklin County, 1 mile south of Lurgan, 500 feet west of intersection of Pennsylvania Township Route T636 and Pennsylvania Route 0997, about 150 feet northwest of T636; USGS Roxbury topographic quadrangle; lat. 40 degrees 4 minutes 27 seconds N. and long. 77 degrees 38 minutes 39 seconds W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine roots; slightly acid; abrupt smooth boundary.
Bt1—8 to 14 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds; few fine rounded black (10YR 2/1) iron-manganese concretions; common medium prominent strong brown (7.5YR 5/8) iron concentrations; few distinct gray (10YR 6/1) iron depletions along faces of peds and root channels; slightly acid; abrupt wavy boundary.
Bt2—14 to 30 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; common distinct clay films on faces of peds; few fine rounded black (10YR 2/1) iron-manganese concretions; common medium prominent strong brown (7.5YR 5/8) iron concentrations; common medium faint gray (10YR 6/1) iron depletions along faces of peds and root channels; slightly acid; abrupt wavy boundary.
Btx1—30 to 40 inches; pale brown (10YR 6/3) silty clay loam; strong coarse prismatic structure parting to weak thin platy; firm, brittle, slightly sticky and plastic; few flattened roots on faces of peds; common fine rounded black (10YR 2/1) iron-manganese concretions; common distinct clay films on faces of peds; many coarse prominent strong brown (7.5YR 5/8) iron concentrations; common medium distinct gray (10YR 6/1) iron depletions along faces of peds; strongly acid; gradual smooth boundary.
2Btx2—40 to 65 inches; pale brown (10YR 6/3) clay loam; weak medium prismatic structure parting to weak thin platy; firm, brittle, slightly sticky and plastic; few flattened roots on faces of peds; common fine rounded black (10YR 2/1) iron-manganese concretions; few distinct clay films on faces of peds; many medium prominent yellowish brown (10YR 5/8) iron concentrations; common coarse distinct gray (10YR 6/1) iron depletions along faces of peds; 5 percent sandstone pebbles; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 80 inches
Depth to bedrock: More than 60 inches
Depth to a fragipan: 20 to 40 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: Less than 10 percent
Kind of rock fragments: Sandstone, siltstone, and shale
Reaction: In unlimed areas strongly acid or very strongly acid

A horizon:
Hue—10YR; value—4 to 6; chroma—1 to 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—0 to 5 percent

Bt horizon:
Hue—10YR or 2.5Y; value—5 or 6; chroma—2 to 4
Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—0 to 5 percent
The horizon has redoximorphic features.

Bx horizon:
Hue—10YR to 5Y; value—5 or 6; chroma—3 to 6
Texture of the fine earth fraction—silty clay loam or clay loam
Content of rock fragments—0 to 10 percent
The horizon has redoximorphic features.

C horizon (if it occurs):
Hue—10YR to 2.5Y; value—5 or 6; chroma—0 to 6
Texture of the fine earth fraction—stratified loam, silt loam, clay loam, or silty clay loam
Content of rock fragments—0 to 15 percent
The horizon has redoximorphic features.

Weikert Series

Depth to bedrock: Shallow
Drainage class: Well drained

Landform: Hills
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from gray and brown, acid shale, siltstone, and fine grained sandstone
Slope range: 3 to 60 percent
Associated soils: Berks, Bedington, Ernest, Brinkerton, Klinesville, Calvin, Atkins, Hazleton, Pope, and Philo
Taxonomic class: Loamy-skeletal, mixed, mesic Lithic Dystrochrepts

Typical Pedon

Weikert channery silt loam, 3 to 8 percent slopes, Hamilton Township, Franklin County, 3 miles west of Chambersburg, 2,000 feet west of intersection of Pennsylvania Routes 4008 and 4010, about 1,000 feet south of Route 4008; USGS Chambersburg topographic quadrangle; lat. 39 degrees 57 minutes 46 seconds N. and long. 77 degrees 44 minutes 3 seconds W.

Ap—0 to 7 inches; dark brown (10YR 4/3) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 30 percent angular and subangular shale channers; strongly acid; clear smooth boundary.
Bw—7 to 14 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; 50 percent angular and subangular shale channers; strongly acid; gradual wavy boundary.
C—14 to 18 inches; yellowish brown (10YR 5/4) extremely channery silt loam; massive; friable, nonsticky and nonplastic; few fine roots; common distinct silt and clay deposits on channers; 70 percent angular and subangular shale channers; very strongly acid; clear wavy boundary.
R—18 inches; dark gray (10YR 4/1) to light gray (10YR 7/1) acid shale and siltstone; fractured acid shale bedrock; more than 4 inches between fractures with little displacement of the pieces; bedrock inclination more than 30 degrees; few distinct clay and silt bridgings between rock fragments.

Range in Characteristics

Thickness of the solum: 8 to 20 inches
Depth to bedrock: 10 to 20 inches
Content of clay in the control section: 10 to 25 percent
Content of rock fragments in the control section: More than 35 percent
Kind of rock fragments: Shale, siltstone, and sandstone
Reaction: In unlimed areas moderately acid to very strongly acid

A horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—2 to 4
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 50 percent

B horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—35 to 60 percent

C horizon:
Hue—7.5YR to 2.5Y; value—4 to 6; chroma—3 to 6
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—60 to 85 percent

Wurno Series

Depth to bedrock: Moderately deep
Drainage class: Well drained
Landform: Ridges
Position on landform: Summits, shoulders, and backslopes
Parent material: Residuum derived from calcareous shale and limestone
Slope range: 3 to 25 percent
Associated soils: Pecktonville, Nollville, Penlaw, Clarksburg, and Elliber
Taxonomic class: Loamy-skeletal, mixed, mesic Dystric Eutrochrepts

Typical Pedon

Wurno channery silt loam, in an area of Wurno-Nollville channery silt loams, 8 to 15 percent slopes, in Thompson Township, Fulton County, 2.5 miles south of Warfordsburg, 1,250 feet west of intersection of Pennsylvania Route 3001 and Pennsylvania Township Route T 401; USGS Hancock topographic quadrangle; lat. 39 degrees 46 minutes 0 seconds N. and long. 78 degrees 11 minutes 15 seconds W.

Ap—0 to 7 inches; dark brown (7.5YR 4/2) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many medium roots; 20 percent angular shale channers; slightly acid; clear wavy boundary.
BA—7 to 11 inches; light yellowish brown (10YR 6/4), and dark yellowish brown (10YR 4/4) very channery silt loam; moderate fine subangular blocky structure; friable, nonsticky and nonplastic; common fine and medium roots between peds;

common prominent manganese or iron-manganese stains on rock fragments; 35 percent calcareous shale channers; slightly alkaline; diffuse wavy boundary.

Bw—11 to 19 inches; yellowish brown (10YR 5/4) and light yellowish brown (10YR 6/4) very channery silt loam; moderate medium subangular blocky structure; friable, nonsticky and nonplastic; common fine roots between peds; many prominent manganese or iron-manganese stains on rock fragments; 50 percent calcareous shale channers; slightly alkaline; diffuse wavy boundary.

C—19 to 26 inches; yellowish brown (10YR 5/4) and strong brown (7.5YR 5/4) extremely channery loam; weak fine and medium subangular blocky structure; friable, nonsticky and nonplastic; few fine roots between peds; many prominent manganese or iron-manganese stains on rock fragments; 70 percent calcareous shale channers; slightly alkaline; abrupt wavy boundary.

Cr—26 to 31 inches; thin-bedded, fractured, calcareous shale with an inclination of more than 30 degrees and with more than 4 inches between fractures; reddish yellow (7.5YR 6/6), brown (7.5YR 5/4), and very pale brown (10YR 7/3) silty clay loam between rock fragments; slightly sticky, nonplastic; few very fine and fine roots matted around rock fragments; slightly alkaline.

R—31 to 41 inches; thin-bedded, fractured, calcareous shale

Range in Characteristics

Thickness of the solum: 12 to 35 inches
Depth to bedrock: 20 to 40 inches
Content of clay in the control section: 18 to 34 percent
Content of rock fragments in the control section: More than 35 percent
Kind of rock fragments: Calcareous shale and siltstone
Reaction: In unlimed areas slightly acid to slightly alkaline

Ap horizon:
Hue—7.5YR or 10YR; value—3 to 5; chroma—2 or 3
Texture of the fine earth fraction—silt loam
Content of rock fragments—15 to 35 percent

BA horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—3 or 4
Texture of the fine earth fraction—silt loam or loam
Content of rock fragments—20 to 40 percent

Bw horizon:
Hue—7.5YR or 10YR; value—4 to 6; chroma—4 to 8
Texture of the fine earth fraction—silt loam or silty clay loam
Content of rock fragments—35 to 65 percent

C horizon:
Hue—7.5YR or 10YR; value—4 or 5; chroma—4 to 8
Texture of the fine earth fraction—loam, silt loam, or silty clay loam
Content of rock fragments—55 to 85 percent

Formation of the Soils

The combined influence of the five factors of soil formation are parent material, relief, climate, plant and animal life, and time. These five factors and processes of soil formation determine the characteristics and properties of a soil.

Factors of Soil Formation

Soils are a mixture of weathered rocks, minerals, organic matter, water, and air. They formed through the chemical and physical weathering of geologic materials. The extent of weathering and the characteristics of any soil depend on the nature of the parent rock; the kind of climate; the relief, or lay of the land; the plant and animal life in and on the soil; and the length of time these factors have affected development.

In a small area such as Fulton County, the factors of vegetation, climate, and time vary only slightly. The nature of the parent material and relief are responsible for most of the differences in soil properties.

The nature of parent rock determines the texture and mineral content of the soils. Relief affects drainage, aeration, runoff, erosion, and exposure to sun and wind. Plant and animal life influences soil characteristics by physical and chemical removals from and additions to the soil. Climate influences the nature and extent of the weathering processes. Time is required for the processes responsible for soil development. Long periods generally are needed for soil development.

Parent Material

Parent material is the unconsolidated mass from which soils are formed. It determines the mineralogical and chemical composition of the soil and, to a large extent, the rate at which soil forming processes take place. In the early stages of soil formation, the mineralogical, physical, and chemical properties of the soil closely resemble those of the parent material. The composition of Weikert soils is similar to the acid shale from which they formed. As a soil ages, the processes of soil formation alter rocks and minerals and the resulting soils generally have quite different characteristics. The properties of Hagerstown soils differ greatly from the original limestone parent material.

Many soils in Fulton County formed in place in residuum directly over the original bedrock. Hazleton soils on major ridges formed in hard orthoquartzite and sandstone. Elliber soils on other low ridges formed in very cherty limestone. Berks and Weikert soils formed in olive, gray, and yellow, acid shale, siltstone, and sandstone. Calvin soils, which are similar to Berks and Weikert soils, formed in red, acid siltstone, shale, and sandstone. Nollville soils formed in calcareous shale and interbedded limestone, but Hagerstown and Carbo soils formed in purer limestone.

Murrill soils formed in transported colluvium derived from sandstone and shale and deposited over limestone. Laidig, Buchanan, and Andover soils formed in colluvium from a mixture of acid shale, siltstone, and sandstone. Pope, Philo, and Atkins soils formed in acid, alluvial material; Melvin and Lindside soils formed in calcareous alluvium.

Parent material and rock type have also had a major effect and influence on topography in Fulton County. Some rock types are much more susceptible to erosion and weathering than others. Mountains and ridges are generally underlain by quartzite and sandstone; the lower hills and valleys are underlain by shale and limestone.

Relief

Relief in Fulton County is dominated by steep ridges and narrow to broad rolling valleys. It has been influenced by strongly folded sedimentary rocks and their degree of resistance or susceptibility to physical and chemical weathering and erosion. Hazleton, Dekalb, and Clymer soils are on the highest ridges; they formed in highly resistant sandstone. On the lower hills and ridges Berks and Weikert soils formed in shale and siltstone, which is intermediate in resistance to weathering. Ernest and Brinkerton soils formed in accumulated soil material at the base of steep slopes through washing, slippage, and gravity. Soils in broad, rolling valleys, such as Carbo and Hagerstown soils, formed in limestone bedrock, which is readily weathered. Lindside, Atkins, and Philo soils formed in recently deposited alluvium adjacent to streams;

Allegheny soils formed in older water deposits on terraces.

Climate

The climate of Fulton County is the humid-temperate, continental type. Indications in the soils suggest this climate prevailed when the soils were forming and that it affected soil formation. Many soils are acid and strongly leached. The effect of climate on the formation of soils has been nearly uniform throughout the county. The formation of some soils, however, may have been affected by a microclimate caused by differences in relief. More information on the climate of Fulton County can be found under "Climate" in the section "General Nature of the County."

Plant and Animal Life

Vegetation, animals, bacteria, and fungi affect soil formation. The vegetation is generally responsible for the amount of nutrients. Animals, such as earthworms, cicadas, and other burrowing animals, help to keep the soil open and porous. Bacteria and fungi decompose vegetation, thus releasing nutrients for plant food. The native forests in Fulton County have had more influence on soil formation than have any other living organism. Humans, however, have greatly influenced the surface layer by clearing the forests and plowing the land. They have added fertilizers, mixed some soil horizons, and moved some soil materials from place to place.

Time

The length of time the factors of soil formation have acted on the weathered mineral material is indicated to some extent by the degree of development in the soil profile. Such soils as Pope, Philo, and Lindside, which formed in alluvium, are considered young or recent because their parent material has been in place for a shorter period of time than other soils in the county. These soils have less distinct horizonation than some older soils on uplands. Berks, Weikert, and Hazleton soils, which formed on uplands, show some horizon development; however, weathering and profile development were slowed by the effects of relief and by the kind of parent material. Bedington, Hagerstown, and Carbo soils have a well developed profile. The parent material of these soils has been in place for a period long enough for distinct horizons to develop.

Processes of Soil Formation

As weathering proceeds and plants grow on a young soil, several processes take place that help to differentiate the layers, or horizons, in a soil. These soil-forming processes are gains, losses, transfers, and transformations. Gains occur as leaves and other organic material are deposited on the surface. Animals, floods, wind, and gravity cause gains of organic matter and minerals, including plant nutrients.

Losses occur as minerals are decomposed and some of the products of weathering are leached from the soil by percolating water. Losses also include the removal of nutrients from the soil in harvesting crops, forage, or trees. Other losses are the removal of fine particles of soil by erosion and the escape of gases as organic matter decays.

Transfers of material from one part of the soil to another are common in most soils. Organic matter is transferred in suspension or in solution from the upper part of the profile to the lower part. As calcium is leached from the surface layer, clay in the subsoil holds some calcium for a while. Silt and clay coatings in the B horizon of Allegheny and Leck Kill soils indicate the transfer of silt and clay from horizons higher in the profile. Plant roots absorb bases and other nutrients, which rise in the stems to be stored in leaves and twigs. When the plants die and decay, the nutrients are returned to the soil.

Transformations in soils occur through chemical weathering. For example, iron, aluminum, calcium, and other elements are released from the primary and secondary minerals in the soil and changed into other compounds. In well drained Hagerstown and Carbo soils, red, brown, and yellow colors gradually replace gray and white colors of the parent material as iron compounds are weathered and oxidized. The red, brown, and yellow colors indicate the release of iron or the oxidation of ferrous oxides to ferric oxides in the presence of an adequate supply of oxygen.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour,

supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a rent characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by soil creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or

establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in

which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated

soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions

of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst. (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as

follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of

moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream

channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 3 percent
Gently sloping	3 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	35 to 45 percent
Very steep	45 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed

slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil creep. Localized form of colluvium. (See Colluvium.)

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and

clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Chambersburg, Pennsylvania)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	35.8	19.3	27.6	61	-7	11	2.70	1.28	3.82	5	10.1
February	39.4	21.6	30.5	67	-4	24	2.67	1.34	3.84	5	9.4
March	50.6	30.2	40.4	79	9	118	3.45	2.03	4.72	7	5.7
April	62.2	39.2	50.7	87	22	331	3.36	1.79	4.75	7	0.6
May	72.6	49.3	60.9	90	30	649	3.79	2.00	5.36	7	0.0
June	80.9	57.9	69.4	94	41	882	3.83	1.99	5.43	6	0.0
July	84.8	62.0	73.4	97	47	1,032	3.45	1.97	4.76	6	0.0
August	83.4	60.4	71.9	96	43	988	3.16	1.95	4.25	6	0.0
September	75.4	53.2	64.8	93	33	744	3.15	1.63	4.49	5	0.0
October	64.5	41.4	53.0	83	22	406	3.04	1.30	4.51	5	0.0
November	52.5	33.8	43.1	75	15	152	3.31	1.92	4.55	6	2.0
December	40.5	24.7	32.6	65	2	30	3.17	1.75	4.43	6	6.2
Yearly:											
Average	62.0	41.1	51.5	---	---	---	---	---	---	---	---
Extreme	103	-16	---	98	-9	---	---	---	---	---	---
Total	---	---	---	---	---	5,366	39.09	32.78	44.31	71	34.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Chambersburg, Pennsylvania)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 11	Apr. 26	May 14
2 years in 10 later than--	Apr. 7	Apr. 22	May 9
5 years in 10 later than--	May 30	Apr. 13	Apr. 29
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 20	Oct. 6	Sept. 28
2 years in 10 earlier than--	Oct. 27	Oct. 12	Oct. 4
5 years in 10 earlier than--	Nov. 9	Oct. 23	Oct. 15

Table 3.--Growing Season

(Recorded in the period 1961-90 at Chambersburg, Pennsylvania)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	197	170	143
8 years in 10	206	178	152
5 years in 10	222	193	168
2 years in 10	239	208	184
1 year in 10	248	215	193

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AgB	Allegheny loam, 3 to 8 percent slopes	337	0.1
AnB	Andover gravelly loam, 3 to 8 percent slopes	586	0.2
AoB	Andover gravelly loam, 0 to 8 percent slopes, very stony	1,068	0.4
As	Atkins silt loam	2,975	1.1
Be	Barbour fine sandy loam	1,169	0.4
Bf	Basher fine sandy loam	4,450	1.6
BhB	Bedington channery silt loam, 3 to 8 percent slopes	93	*
BhC	Bedington channery silt loam, 8 to 15 percent slopes	251	*
BhD	Bedington channery silt loam, 15 to 25 percent slopes	393	0.1
BkB	Berks channery silt loam, 3 to 8 percent slopes	3,070	1.1
BkC	Berks channery silt loam, 8 to 15 percent slopes	6,715	2.4
BkD	Berks channery silt loam, 15 to 25 percent slopes	4,742	1.7
BrA	Brinkerton silt loam, 0 to 3 percent slopes	215	*
BrB	Brinkerton silt loam, 3 to 8 percent slopes	1,278	0.5
BuB	Buchanan gravelly loam, 3 to 8 percent slopes	1,050	0.4
BuC	Buchanan gravelly loam, 8 to 15 percent slopes	856	0.3
BxB	Buchanan cobbly loam, 0 to 8 percent slopes, extremely stony	3,320	1.2
BxD	Buchanan cobbly loam, 8 to 25 percent slopes, extremely stony	6,752	2.4
CaB	Calvin channery loam, 3 to 8 percent slopes	3,841	1.4
CaC	Calvin channery loam, 8 to 15 percent slopes	12,933	4.6
CaD	Calvin channery loam, 15 to 25 percent slopes	6,002	2.1
CkB	Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes	7,044	2.5
CoC	Carbo silty clay loam, 8 to 15 percent slopes	214	*
CoD	Carbo silty clay loam, 15 to 25 percent slopes	558	0.2
CrC	Cedarcreek very channery loam, 3 to 25 percent slopes	325	0.1
CrF	Cedarcreek extremely channery loam, 25 to 80 percent slopes	325	0.1
CsB	Clarksburg silt loam, 3 to 8 percent slopes	3,075	1.1
DEF	Dekalb and Hazleton soils, 25 to 75 percent slopes, rubbly	1,908	0.7
EgB	Elliber very channery silt loam, 3 to 8 percent slopes	112	*
EgC	Elliber very channery silt loam, 8 to 15 percent slopes	370	0.1
EgD	Elliber very channery silt loam, 15 to 25 percent slopes	260	*
ErB	Ernest silt loam, 3 to 8 percent slopes	1,895	0.7
FrB	Frankstown channery silt loam, 3 to 8 percent slopes	401	0.1
FrC	Frankstown channery silt loam, 8 to 15 percent slopes	810	0.3
FrD	Frankstown channery silt loam, 15 to 25 percent slopes	560	0.2
FrE	Frankstown channery silt loam, 25 to 35 percent slopes	733	0.3
Fu	Funkstown silt loam	67	*
HaB	Hagerstown silt loam, 3 to 8 percent slopes	2,547	0.9
HaC	Hagerstown silt loam, 8 to 15 percent slopes	1,955	0.7
HbB	Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes	222	*
HkE	Hagerstown-Rock outcrop complex, 8 to 35 percent slopes	666	0.2
HOD	Hazleton and Clymer soils, 8 to 25 percent slopes, extremely stony	1,977	0.7
HRB	Hazleton and Dekalb soils, 0 to 8 percent slopes, extremely stony	2,416	0.9
HRD	Hazleton and Dekalb soils, 8 to 25 percent slopes, extremely stony	7,105	2.5
HRF	Hazleton and Dekalb soils, 25 to 75 percent slopes, extremely stony	19,240	6.9
HwB	Hustontown silt loam, 3 to 8 percent slopes	3,807	1.4
Jg	Jugtown-Lindside silt loams	584	0.2
KaB	Klinesville channery silt loam, 3 to 8 percent slopes	2,200	0.8
KaC	Klinesville channery silt loam, 8 to 15 percent slopes	17,690	6.3
KaD	Klinesville channery silt loam, 15 to 25 percent slopes	14,329	5.1
KWF	Klinesville and Weikert soils, 25 to 60 percent slopes	42,177	15.0
LaB	Laidig gravelly loam, 3 to 8 percent slopes	300	0.1
LaC	Laidig gravelly loam, 8 to 15 percent slopes	652	0.2
LbB	Laidig gravelly loam, 0 to 8 percent slopes, extremely stony	493	0.2
LbD	Laidig gravelly loam, 8 to 25 percent slopes, extremely stony	17,415	6.2
LCE	Laidig and Hazleton soils, 25 to 60 percent slopes, extremely stony	6,437	2.3
Ln	Lindside silt loam	31	*
Me	Melvin silt loam	760	0.3
MoB	Monongahela silt loam, 3 to 8 percent slopes	1,741	0.6
MrB	Murrill gravelly loam, 3 to 8 percent slopes	2,211	0.8
MrC	Murrill gravelly loam, 8 to 15 percent slopes	1,671	0.6

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
MvD	Murrill gravelly loam, 8 to 25 percent slopes, extremely stony	569	0.2
PcB	Pecktonville gravelly silt loam, 3 to 8 percent slopes	41	*
PcC	Pecktonville gravelly silt loam, 8 to 15 percent slopes	162	*
PeE	Pecktonville-Rock ourcrop complex, 25 to 45 percent slopes	42	*
Pg	Penlaw silt loam, 0 to 3 percent slopes	1,517	0.5
Ph	Philo silt loam	1,059	0.4
Po	Pope silt loam	550	0.2
Pu	Purdy silty clay loam	158	*
Q	Quarries	247	*
SeB	Sideling gravelly loam, 3 to 8 percent slopes	335	0.1
SeC	Sideling gravelly loam, 8 to 15 percent slopes	924	0.3
SeD	Sideling gravelly loam, 15 to 25 percent slopes	675	0.2
SrB	Sideling gravelly loam, 0 to 8 percent slopes, extremely stony	272	*
SrD	Sideling gravelly loam, 8 to 25 percent slopes, extremely stony	8,920	3.2
SSF	Sideling and Hazleton soils, 25 to 60 percent slopes, extremely stony	11,645	4.2
Ty	Tyler silt loam, 0 to 3 percent slopes	445	0.2
Uu	Urban land-Udorthents complex, 0 to 25 percent slopes	172	*
WeB	Weikert channery silt loam, 3 to 8 percent slopes	1,377	0.5
WeC	Weikert channery silt loam, 8 to 15 percent slopes	9,385	3.3
WeD	Weikert channery silt loam, 15 to 25 percent slopes	6,620	2.4
WuB	Wurno-Nollville channery silt loams, 3 to 8 percent slopes	614	0.2
WuC	Wurno-Nollville channery silt loams, 8 to 15 percent slopes	1,988	0.7
WuD	Wurno-Nollville channery silt loams, 15 to 25 percent slopes	1,967	0.7
WuE	Wurno-Nollville channery silt loams, 25 to 45 percent slopes	178	*
	Water	1,005	0.4
	Total	280,246	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture	Soybeans	Wheat
		Tons	Bu	Tons	Tons	AUM*	Bu	Bu
AgB--- Allegheny	2e	4.50	130.00	25.00	3.50	7.00	45.00	50.00
AnB--- Andover	4w	---	85.00	17.00	2.50	5.00	25.00	30.00
AoB--- Andover	7s	---	---	---	---	---	---	---
As--- Atkins	3w	---	100.00	20.00	3.00	5.50	40.00	30.00
Be--- Barbour	1	4.50	125.00	25.00	3.50	8.50	45.00	50.00
Bf--- Basher	2w	4.50	120.00	24.00	3.50	8.50	40.00	45.00
BhB--- Bedington	2e	5.00	120.00	24.00	3.50	8.50	40.00	50.00
BhC--- Bedington	3e	4.50	110.00	23.00	3.50	8.00	35.00	45.00
BhD--- Bedington	4e	4.00	105.00	21.00	3.00	7.50	35.00	40.00
BkB--- Berks	2e	3.50	80.00	16.00	3.00	6.50	35.00	40.00
BkC--- Berks	3e	3.00	75.00	15.00	2.50	5.50	35.00	40.00
BkD--- Berks	4e	3.00	70.00	14.00	2.50	5.50	30.00	35.00
BrA--- Brinkerton	4w	---	90.00	18.00	2.50	5.00	25.00	30.00
BrB--- Brinkerton	4w	---	90.00	17.00	2.50	5.00	25.00	30.00
BuB--- Buchanan	2w	3.50	100.00	20.00	3.00	6.50	35.00	40.00
BuC--- Buchanan	3e	3.50	90.00	18.00	3.00	5.50	30.00	35.00
BxB--- Buchanan	7s	---	---	---	---	---	---	---
BxD--- Buchanan	7s	---	---	---	---	---	---	---
CaB--- Calvin	2e	3.50	85.00	17.00	3.00	6.50	35.00	45.00

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture	Soybeans	Wheat
		Tons	Bu	Tons	Tons	AUM*	Bu	Bu
CaC---- Calvin	3e	3.00	80.00	16.00	2.50	6.00	35.00	40.00
CaD---- Calvin	4e	3.00	70.00	15.00	2.50	5.50	30.00	35.00
CkB---- Calvin-Leck Kill	2e	4.00	115.00	23.00	3.00	6.50	40.00	50.00
CoC---- Carbo	3e	4.00	100.00	20.00	3.50	6.50	35.00	50.00
CoD---- Carbo	4e	3.00	95.00	19.00	2.50	6.00	30.00	35.00
CrC---- Cedarcreek	6s	---	---	---	---	---	---	---
CrF---- Cedarcreek	7s	---	---	---	---	---	---	---
CsB---- Clarksburg	2e	3.50	110.00	21.00	3.50	6.50	35.00	45.00
DEF---- Dekalb-Hazleton	7s	---	---	---	---	---	---	---
EgB---- Elliber	2e	3.50	110.00	21.00	3.00	6.00	35.00	40.00
EgC---- Elliber	3e	3.50	110.00	20.00	2.50	6.00	35.00	40.00
EgD---- Elliber	4e	2.50	85.00	18.00	2.00	5.50	25.00	35.00
ErB---- Ernest	2w	3.00	100.00	20.00	3.00	6.50	35.00	40.00
FrB---- Frankstown	2e	4.50	125.00	25.00	3.50	7.50	40.00	45.00
FrC---- Frankstown	3e	4.50	120.00	24.00	3.50	7.50	35.00	40.00
FrD---- Frankstown	4e	4.00	110.00	22.00	3.00	6.50	30.00	35.00
FrE---- Frankstown	6e	---	---	---	---	6.00	---	---
Fu---- Funkstown	2w	5.00	135.00	24.00	3.50	8.50	50.00	50.00
HaB---- Hagerstown	2e	5.50	140.00	27.00	3.50	8.50	50.00	55.00
HaC---- Hagerstown	3e	5.00	130.00	26.00	3.50	8.50	40.00	50.00
HbB---- Hagerstown-Carbo	2e	5.00	125.00	25.00	3.50	8.50	40.00	50.00

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture	Soybeans	Wheat
		Tons	Bu	Tons	Tons	AUM*	Bu	Bu
HkE**:								
Hagerstown	4e	---	---	---	3.00	6.50	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
HOD---------- Hazleton-Clymer	7s	---	---	---	---	---	---	---
HRB---------- Hazleton-Dekalb	7s	---	---	---	---	---	---	---
HRD---------- Hazleton-Dekalb	7s	---	---	---	---	---	---	---
HRF---------- Hazleton-Dekalb	7s	---	---	---	---	---	---	---
HwB---------- Hustontown	2e	3.00	100.00	20.00	3.00	6.50	35.00	40.00
Jg---------- Jugtown-Lindside	2w	4.00	125.00	26.00	4.50	7.50	45.00	45.00
KaB---------- Klinesville	3e	2.50	60.00	12.00	2.00	5.00	30.00	30.00
KaC---------- Klinesville	4e	2.50	55.00	11.00	2.00	5.00	30.00	35.00
KaD---------- Klinesville	6e	2.00	---	---	1.50	5.00	---	---
KWF---------- Klinesville-Weikert	7e	---	---	---	---	---	---	---
LaB---------- Laidig	2e	4.00	100.00	20.00	3.00	4.50	40.00	45.00
LaC---------- Laidig	3e	4.00	95.00	19.00	3.00	4.50	35.00	40.00
LbB---------- Laidig	7s	---	---	---	---	---	---	---
LbD---------- Laidig	7s	---	---	---	---	---	---	---
LCE---------- Laidig-Hazleton	7s	---	---	---	---	---	---	---
Ln---------- Lindside	2w	4.50	120.00	24.00	3.50	7.50	45.00	40.00
Me---------- Melvin	3w	---	100.00	16.00	3.50	6.00	35.00	30.00
MoB---------- Monongahela	2e	3.50	120.00	24.00	3.00	6.50	45.00	50.00
MrB---------- Murrill	2e	4.50	120.00	24.00	3.50	8.50	40.00	45.00

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture	Soybeans	Wheat
		Tons	Bu	Tons	Tons	AUM*	Bu	Bu
MrC---------- Murrill	3e	4.00	110.00	22.00	3.00	7.50	35.00	40.00
MvD---------- Murrill	7s	---	---	---	---	---	---	---
PcB---------- Pecktonville	3e	4.50	120.00	24.00	3.00	4.00	40.00	50.00
PcC---------- Pecktonville	4e	4.50	110.00	22.00	3.00	3.50	40.00	50.00
PeE---------- Pecktonville	7s	---	---	---	---	---	---	---
Pg---------- Penlaw	3w	3.00	95.00	19.00	3.00	6.00	30.00	40.00
Ph---------- Philo	2w	4.50	120.00	24.00	3.50	8.50	45.00	50.00
Po---------- Pope	1	4.50	130.00	24.00	4.00	8.50	40.00	50.00
Pu---------- Purdy	4w	---	80.00	16.00	2.50	6.00	25.00	30.00
Q**---------- Quarries	8s	---	---	---	---	---	---	---
SeB---------- Sideling	2e	3.50	110.00	21.00	2.50	5.50	30.00	35.00
SeC---------- Sideling	3e	3.50	90.00	19.00	2.50	5.50	30.00	35.00
SeD---------- Sideling	4e	3.00	80.00	16.00	2.00	3.00	30.00	35.00
SrB---------- Sideling	6s	---	---	---	---	---	---	---
SrD---------- Sideling	7s	---	---	---	---	---	---	---
SSF---------- Sideling-Hazleton	7s	---	---	---	---	---	---	---
Ty---------- Tyler	3w	---	95.00	19.00	3.00	7.50	25.00	35.00
Uu---------- Urban land-Udorthents	8s	---	---	---	---	---	---	---
WeB---------- Weikert	3e	2.00	60.00	12.00	2.00	4.00	20.00	25.00
WeC---------- Weikert	4e	2.00	55.00	11.00	2.00	4.00	20.00	20.00

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture	Soybeans	Wheat
		Tons	Bu	Tons	Tons	AUM*	Bu	Bu
WeD---------- Weikert	6e	2.00	---	---	2.00	3.50	---	---
WuB---------- Wurno-Nollville	2e	3.50	105.00	21.00	3.50	6.50	35.00	40.00
WuC---------- Wurno-Nollville	3e	3.50	100.00	20.00	3.00	6.00	35.00	40.00
WuD---------- Wurno-Nollville	4e	3.00	90.00	19.00	2.50	5.50	30.00	35.00
WuE**: Wurno-Nollville---------	6e	---	---	---	---	4.50	---	---

* 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.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
AgB	Allegheny loam, 3 to 8 percent slopes
Be	Barbour fine sandy loam
Bf	Basher fine sandy loam
BhB	Bedington channery silt loam, 3 to 8 percent slopes
BuB	Buchanan gravelly loam, 3 to 8 percent slopes
CkB	Calvin-Leck Kill channery silt loams, 3 to 8 percent slopes
CsB	Clarksburg silt loam, 3 to 8 percent slopes
EgB	Elliber very channery silt loam, 3 to 8 percent slopes
FrB	Frankstown channery silt loam, 3 to 8 percent slopes
Fu	Funkstown silt loam
HaB	Hagerstown silt loam, 3 to 8 percent slopes
HbB	Hagerstown-Carbo silty clay loams, 3 to 8 percent slopes
Jg	Jugtown-Lindside silt loams
LaB	Laidig gravelly loam, 3 to 8 percent slopes
Ln	Lindside silt loam
MrB	Murrill gravelly loam, 3 to 8 percent slopes
PcB	Pecktonville gravelly silt loam, 3 to 8 percent slopes
Ph	Philo silt loam
Po	Pope silt loam
SeB	Sideling gravelly loam, 3 to 8 percent slopes
WuB	Wurno-Nollville channery silt loams, 3 to 8 percent slopes

Table 7.--Forestland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that the soil was not rated)

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
AgB Allegheny	4A	Slight	Moderate	Slight	Slight	Severe	American elm Virginia pine Black oak* Northern red oak Pignut hickory Red maple Sugar maple Tulip poplar White ash	--- 72 78 --- --- --- --- 93 ---	--- 114 57 --- --- --- --- 100 ---	Black walnut, eastern white pine, northern red oak, tulip poplar, white ash, white oak.
AnB Andover	4W	Slight	Severe	Severe	Moderate	Severe	Northern red oak* Tulip poplar	75 83	57 72	Norway spruce, eastern white pine.
AoB Andover	4W	Slight	Severe	Severe	Moderate	Severe	Northern red oak* Tulip poplar	70 75	57 57	Norway spruce, eastern white pine.
As Atkins	5W	Slight	Severe	Severe	Moderate	Severe	American sycamore Pin oak* Red maple	--- 85 ---	--- 72 ---	Eastern white pine, pin oak, white spruce.
Be Barbour	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak* Sugar maple	80 70	57 43	Norway spruce, black walnut, eastern white pine.
Bf Basher	4A	Slight	Slight	Slight	Slight	Moderate	American basswood Northern red oak* Sugar maple	85 80 70	57 57 43	Norway spruce, black walnut, eastern white pine.
BhB Bedington	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak* Tulip poplar	75 85	57 86	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
BhC Bedington	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak* Tulip poplar	75 85	57 86	Norway spruce, Virginia pine, black walnut, eastern white pine, tuliptree.
BhD Bedington	4A	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak* Tulip poplar	75 85	57 86	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
BkB Berks	4F	Slight	Slight	Moderate	Slight	Moderate	Virginia pine Black oak Northern red oak*	70 70 70	114 57 57	Norway spruce, Virginia pine, eastern white pine, red pine.
BkC Berks	4F	Slight	Slight	Moderate	Slight	Moderate	Virginia pine Black oak Northern red oak*	70 70 70	114 57 57	Norway spruce, Virginia pine, eastern white pine, red pine.

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
BkD---------- Berks	4F	Moderate	Moderate	Moderate	Slight	Moderate	Virginia pine------- Black oak---------- Northern red oak*---	70 70 70	114 57 57	Norway spruce, Virginia pine, eastern white pine, red pine.
BrA---------- Brinkerton	4W	Slight	Severe	Severe	Moderate	Severe	Northern red oak*---	77	57	Eastern white pine, tulip poplar, white spruce.
BrB---------- Brinkerton	4W	Slight	Severe	Severe	Moderate	Severe	Northern red oak*---	77	57	Eastern white pine, tulip poplar, white spruce.
BuB---------- Buchanan	4W	Slight	Slight	Slight	Slight	Moderate	Northern red oak*--- Tulip poplar--------	80 90	57 86	Norway spruce, eastern white pine, northern red oak, tulip poplar.
BuC---------- Buchanan	4W	Slight	Slight	Slight	Slight	Moderate	Northern red oak*--- Tulip poplar--------	80 90	57 86	Norway spruce, eastern white pine, northern red oak, tulip poplar.
BxB---------- Buchanan	4X	Slight	Moderate	Slight	Slight	Moderate	Northern red oak*--- Tulip poplar--------	80 90	57 86	Eastern white pine, northern red oak, tulip poplar.
BxD---------- Buchanan	4X	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak*--- Tulip poplar--------	80 90	57 86	Eastern white pine, northern red oak, tulip poplar.
CaB---------- Calvin	4F	Slight	Slight	Moderate	Slight	Moderate	Northern red oak*--- Tulip poplar--------	71 80	57* 72	Virginia pine, eastern white pine, red pine.
CaC---------- Calvin	4F	Slight	Slight	Moderate	Slight	Moderate	Northern red oak*--- Tulip poplar--------	71 80	57 72	Virginia pine, eastern white pine, red pine.
CaD:										
Calvin----------	4F	Moderate	Moderate	Moderate	Slight	Moderate	Northern red oak*--- Tulip poplar--------	71 80	57 72	Virginia pine, eastern white pine, red pine.
CkB*:										
Calvin----------	4F	Slight	Slight	Moderate	Slight	Moderate	Northern red oak*--- Tulip poplar--------	71 80	57 72	Virginia pine, eastern white pine, red pine.
Leck Kill----------	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak*---	68	57	Virginia pine, eastern white pine.
CoC---------- Carbo	4C	Slight	Moderate	Slight	Moderate	Moderate	Virginia pine------- Northern red oak*--- Tulip poplar--------	55 70 80	86 57 72	Scotch pine, black walnut, eastern white pine.
CoD---------- Carbo	4C	Moderate	Moderate	Slight	Moderate	Moderate	Virginia pine------- Northern red oak*--- Tulip poplar--------	55 70 80	86 57 72	Scotch pine, black walnut, eastern white pine.

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
CrC---------- Cedarcreek	4X	Slight	Slight	Severe	Slight	Moderate	American sycamore---	90	100	Virginia pine, black locust, eastern white pine.
							Black locust--------	---	---	
							Eastern white pine--	94	172	
							Northern red oak*---	80	57	
							Tulip poplar--------	105	114	
CrF---------- Cedarcreek	4R	Severe	Severe	Severe	Slight	Moderate	American sycamore---	90	100	Virginia pine, black locust, eastern white pine.
							Black locust--------	---	---	
							Eastern white pine--	94	172	
							Northern red oak*---	80	57	
							Tulip poplar--------	105	114	
CsB---------- Clarksburg	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak*---	75	57	Norway spruce, eastern white pine, tulip poplar.
							Tulip poplar--------	85	86	
DEF*:										
Dekalb----------	2X	Severe	Severe	Severe	Moderate	Moderate	Northern red oak*---	52	29	Norway spruce, Virginia pine, eastern white pine, white spruce.
Hazleton----------	4X	Severe	Severe	Severe	Moderate	Moderate	Northern red oak*---	70	57	Norway spruce, eastern white pine.
							Tulip poplar--------	80	72	
EgB---------- Elliber	4F	Slight	Slight	Slight	Slight	Moderate	Northern red oak*---	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Tulip poplar--------	90	86	
EgC---------- Elliber	4F	Slight	Slight	Slight	Slight	Moderate	Northern red oak*---	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Tulip poplar--------	90	86	
EgD---------- Elliber	4F	Moderate	Moderate	Slight	Slight	Severe	Northern red oak*---	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Tulip poplar--------	95	100	
ErB---------- Ernest	4A	Slight	Moderate	Slight	Slight	Severe	Black cherry--------	80	57	Norway spruce, eastern white pine.
							Black walnut--------	---	---	
							Northern red oak*---	80	57	
							Sugar maple---------	80	57	
							Tulip poplar--------	89	86	
							White ash-----------	---	---	
FrB---------- Frankstown	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine-------	80	114	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
							Black locust--------	---	---	
							Black walnut--------	---	---	
							Northern red oak*---	79	57	
							Tulip poplar--------	85	86	
							White ash-----------	---	---	
							White oak-----------	80	57	

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
FrC--Frankstown	4A	Moderate	Slight	Slight	Slight	Severe	Virginia pine	80	114	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
							Black locust	---	---	
							Black walnut	---	---	
							Northern red oak*	79	57	
							Tulip poplar	85	86	
							White ash	---	---	
							White oak	80	57	
FrD--Frankstown	4R	Moderate	Moderate	Slight	Slight	Severe	Virginia pine	80	114	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
							Black locust	---	---	
							Black walnut	---	---	
							Northern red oak*	79	57	
							Tulip poplar	85	86	
							White ash	---	---	
							White oak	80	57	
FrE--Frankstown	4R	Severe	Severe	Slight	Slight	Severe	Virginia pine	80	114	Norway spruce, Virginia pine, black walnut, eastern white pine, tulip poplar.
							Black locust	---	---	
							Black walnut	---	---	
							Northern red oak*	79	57	
							Tulip poplar	85	86	
							White ash	---	---	
							White oak	80	57	
Fu--Funkstown	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak*	85	72	Black locust, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
HaB--Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
HaC--Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
HbB*:										
Hagerstown	5C	Slight	Moderate	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
Carbo	4C	Slight	Moderate	Slight	Moderate	Moderate	Virginia pine	55	86	Scotch pine, black walnut, eastern white pine.
							Northern red oak*	70	57	
							Tulip poplar	80	72	
HkE*:										
Hagerstown	5R	Severe	Severe	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
Rock outcrop.										

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
HOD*:										
Hazleton	4F	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak*	70	57	Norway spruce,
							Tulip poplar	80	72	Virginia pine, eastern white pine, tulip poplar.
Clymer	4A	Moderate	Moderate	Slight	Slight	Moderate	Eastern white pine	---	---	Norway spruce,
							Northern red oak*	83	57	Virginia pine,
							Tulip poplar	95	100	eastern white pine, tulip poplar.
HRB*:										
Hazleton	4X	Slight	Moderate	Slight	Slight	Moderate	Northern red oak*	70	57	Norway spruce,
							Tulip poplar	80	72	eastern white pine.
Dekalb	3X	Slight	Moderate	Moderate	Slight	Moderate	Northern red oak*	57	43	Eastern white pine, red pine.
HRD*:										
Hazleton	4X	Moderate	Moderate	Moderate	Moderate	Moderate	Northern red oak*	70	57	Norway spruce,
							Tulip poplar	80	72	eastern white pine.
Dekalb	2X	Moderate	Moderate	Moderate	Moderate	Moderate	Northern red oak*	52	29	Norway spruce, Virginia pine, eastern white pine, white spruce.
HRF*:										
Hazleton	4R	Severe	Severe	Slight	Slight	Moderate	Northern red oak*	70	57	Norway spruce,
							Tulip poplar	80	72	eastern white pine.
Dekalb	2R	Severe	Severe	Moderate	Moderate	Moderate	Northern red oak*	52	29	Norway spruce, Virginia pine, eastern white pine, white spruce.
HwB	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak*	70	57	Norway spruce,
Hustontown							Red maple	---	---	eastern white
							Tulip poplar	75	57	pine, red pine,
							White ash	---	---	white spruce.
Jg*:										
Jugtown	5A	Slight	Slight	Slight	Slight	Severe	Black cherry	---	---	Norway spruce,
							Northern red oak*	86	72	black walnut,
							Sugar maple	---	---	eastern white
							Tulip poplar	95	100	pine, tulip poplar.
							White ash	---	---	
							White oak	---	---	

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
Jg*:										
Lindside	5A	Slight	Slight	Slight	Slight	Severe	Black walnut	---	---	Norway spruce, black oak, black walnut, eastern white pine, northern red oak, tulip poplar, white ash, white oak.
							Northern red oak*	86	72	
							Red maple	---	---	
							Tulip poplar	95	100	
							White ash	---	---	
							White oak	85	72	
KaB Klinesville	3D	Slight	Slight	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine, pitch pine, red pine.
							Northern red oak*	60	43	
KaC Klinesville	3D	Slight	Slight	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine, pitch pine, red pine.
							Northern red oak*	60	43	
KaD Klinesville	3D	Moderate	Moderate	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine, pitch pine, red pine.
							Northern red oak*	60	43	
KWF*:										
Klinesville	3R	Severe	Severe	Moderate	Slight	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine, pitch pine, red pine.
							Northern red oak*	60	43	
Weikert	3R	Severe	Severe	Severe	Moderate	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine.
							Northern red oak*	64	43	
LaB Laidig	4A	Slight	Slight	Slight	Slight	Moderate	Black cherry	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Black locust	80	---	
							Eastern white pine	90	172	
							Northern red oak*	80	57	
							Sugar maple	80	57	
							Tulip poplar	90	86	
							White ash	---	---	
							White oak	80	57	
LaC Laidig	4A	Slight	Slight	Slight	Slight	Moderate	Black cherry	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Black locust	80	---	
							Eastern white pine	90	172	
							Northern red oak*	80	57	
							Sugar maple	80	57	
							Tulip poplar	90	86	
							White ash	---	---	
							White oak	80	57	
LbB Laidig	4X	Slight	Moderate	Slight	Slight	Slight	Black cherry	80	57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
							Black locust	80	---	
							Northern red oak*	80	57	
							Sugar maple	80	57	
							Tulip poplar	90	86	
							White ash	---	---	
							White oak	80	57	

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
LbD---------- Laidig	4X	Moderate	Moderate	Slight	Slight	Slight	Black cherry-------- Black locust-------- Northern red oak*--- Sugar maple--------- Tulip poplar-------- White ash---------- White oak----------	80 80 80 80 90 --- 80	57 --- 57 57 86 --- 57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
LCE*:										
Hazleton----------	4R	Severe	Severe	Slight	Slight	Moderate	Northern red oak*--- Tulip poplar--------	70 80	57 72	Norway spruce, eastern white pine.
Laidig----------	4R	Severe	Severe	Slight	Slight	Slight	Black cherry-------- Black locust-------- Northern red oak*--- Sugar maple--------- Tulip poplar-------- White ash---------- White oak----------	80 80 80 80 90 --- 80	57 --- 57 57 86 --- 57	Norway spruce, black locust, black walnut, eastern white pine, tulip poplar.
Ln---------- Lindside	5A	Slight	Slight	Slight	Slight	Severe	Black walnut-------- Northern red oak*--- Red maple---------- Tulip poplar-------- White ash---------- White oak----------	--- 86 --- 95 --- 85	--- 72 --- 100 --- 72	Norway spruce, black oak, black walnut, eastern white pine, northern red oak, tulip poplar, white ash, white oak.
Me---------- Melvin	5W	Slight	Severe	Moderate	Severe	Severe	American elm-------- Common hackberry---- Green ash---------- Hickory---------- Pin oak*---------- Red maple---------- Sweetgum----------	--- --- --- --- 85 --- 90	--- --- --- --- 72 --- 100	Baldcypress, green ash, pin oak.
MoB---------- Monongahela	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine------- Black walnut-------- Eastern white pine-- Northern red oak*--- Tulip poplar-------- White ash----------	66 --- 72 70 85 ---	100 --- 129 57 86 ---	Virginia pine, eastern white pine, tulip poplar.
MrB---------- Murrill	4A	Slight	Slight	Slight	Slight	Severe	Eastern white pine-- Northern red oak*--- Tulip poplar--------	80 72 95	143 57 100	Norway spruce, black walnut, eastern white pine, tulip poplar.
MrC---------- Murrill	4A	Slight	Slight	Slight	Slight	Severe	Eastern white pine-- Northern red oak*--- Tulip poplar--------	80 72 95	143 57 100	Norway spruce, black walnut, eastern white pine, tulip poplar.

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
MvD Murrill	4X	Moderate	Moderate	Slight	Slight	Moderate	Black walnut Eastern white pine Northern red oak* Tulip poplar White ash	--- 80 72 94 ---	--- 143 57 100 ---	Norway spruce, black walnut, eastern white pine, tulip poplar.
PcB Pecktonville	4A	Slight	Slight	Moderate	Slight	Moderate	Chestnut oak Northern red oak*	76 76	57 57	Black walnut, tulip poplar.
PcC Pecktonville	4A	Slight	Slight	Moderate	Slight	Moderate	Chestnut oak Northern red oak*	76 76	57 57	Black walnut, tulip poplar.
PeE Pecktonville	4R	Severe	Severe	Moderate	Slight	Moderate	chestnut oak Northern red oak*	76 76	57 57	Black walnut, tulip poplar.
Pg Penlaw	4W	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak* Red maple Sugar maple Tulip poplar White ash	80 80 80 90 ---	57 57 57 86 ---	Norway spruce, eastern white pine, tulip poplar, white spruce.
Ph Philo	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine Black oak Northern red oak* Tulip poplar White ash White oak	74 80 80 102 --- 80	114 57 57 114 --- 57	Eastern white pine, tulip poplar.
Po Pope	4A	Slight	Slight	Slight	Slight	Severe	American basswood American beech American sycamore Bitternut hickory Blackgum Eastern hemlock Northern red oak* Tulip poplar White oak	--- --- --- --- --- --- 80 96 80	--- --- --- --- --- --- 57 100 57	Black walnut, eastern white pine, northern red oak, tulip poplar, white ash, white oak.
Pu Purdy	5W	Slight	Severe	Severe	Severe	Moderate	Virginia pine Pin oak* Sweetgum Tulip poplar	75 85 85 90	114 72 86 86	Virginia pine, eastern white pine, loblolly pine.
Q*. Quarries										
SeB Sideling	5F	Slight	Slight	Slight	Slight	Moderate	Northern red oak* Tulip poplar	85 95	72 100	Ash, eastern white pine, northern red oak, tulip poplar.
SeC Sideling	5F	Moderate	Slight	Slight	Slight	Moderate	Northern red oak* Tulip poplar	85 95	72 100	Ash, eastern white pine, northern red oak, tulip poplar.
SeD Sideling	5F	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak* Tulip poplar	85 95	72 100	Ash, eastern white pine, northern red oak, tulip poplar.

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
SSF*:										
Sideling	5R	Severe	Severe	Moderate	Slight	Moderate	Northern red oak*	85	72	Ash, eastern white pine, northern red oak, tulip poplar.
							Tulip poplar	95	100	
Ty	4D	Slight	Slight	Moderate	Severe	Severe	American beech	---	---	Virginia pine, black oak, eastern white pine, red pine, tulip poplar, white ash.
Tyler							American sycamore	---	---	
							Northern red oak*	80	57	
							Slippery elm	---	---	
							Sugar maple	---	---	
							Tulip poplar	100	114	
							White ash	---	---	
							White oak	---	---	
Uu:										
Udorthents.										
Urban land.										
WeB	3D	Slight	Slight	Severe	Moderate	Moderate	Virginia pine	56	86	Virginia pine, eastern white pine, red pine.
Weikert							Northern red oak*	59	43	
WeC	3D	Slight	Slight	Severe	Moderate	Moderate	Virginia pine	56	86	Virginia pine, eastern white pine, red pine.
Weikert							Northern red oak*	59	43	
WeD	3D	Moderate	Moderate	Severe	Moderate	Moderate	Virginia pine	60	86	Virginia pine, eastern white pine.
Weikert							Northern red oak*	64	43	
WuB*:										
Wurno	4F	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Virginia pine, eastern white pine.
							Scarlet oak*	70	57	
Nollville	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
WuC*:										
Wurno	4F	Slight	Slight	Slight	Slight	Moderate	Virginia pine	70	114	Virginia pine, eastern white pine.
							Scarlet oak*	70	57	
Nollville	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	
WuD*:										
Wurno	4F	Moderate	Moderate	Moderate	Slight	Moderate	Virginia pine	70	114	Virginia pine, eastern white pine.
							Scarlet oak*	70	57	
Nollville	5R	Moderate	Moderate	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	

See footnotes at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to manage
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber	
WuE*:										
Wurno	4R	Severe	Severe	Moderate	Slight	Moderate	Virginia pine	70	114	Virginia pine, eastern white pine.
							Scarlet oak*	70	57	
Nollville	5R	Severe	Severe	Slight	Slight	Severe	Northern red oak*	85	72	Norway spruce, black walnut, eastern white pine, tulip poplar.
							Tulip poplar	95	100	

* This is the indicator species for the soil.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Recreational Development

(The information in this report indicates the dominant soil condition, but does not eliminate the need for onsite investigation)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AgB---- Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
AnB---- Andover	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
AoB---- Andover	Severe: wetness.	Severe: wetness.	Severe: large stones, small stones, wetness.	Severe: wetness.	Severe: wetness.
As---- Atkins	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Be---- Barbour	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Bf---- Basher	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
BhB---- Bedington	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
BhC---- Bedington	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
BhD---- Bedington	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BkB---- Berks	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight	Severe: small stones, droughty.
BkC---- Berks	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones, droughty.
BkD---- Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, droughty, slope.
BrA---- Brinkerton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BrB---- Brinkerton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BuB---- Buchanan	Severe: small stones.	Severe: small stones.	Severe: small stones.	Moderate: wetness.	Severe: small stones.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BuC: Buchanan	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Moderate: wetness.	Severe: small stones.
BxB Buchanan	Severe: large stones, small stones, too acid.	Severe: large stones, small stones, too acid.	Severe: large stones, small stones, too acid.	Moderate: wetness.	Severe: too acid, small stones.
BxD Buchanan	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: wetness, slope.	Severe: too acid, small stones, slope.
CaB Calvin	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones, droughty.
CaC Calvin	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, droughty.
CaD Calvin	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CkB*: Calvin	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones, droughty.
Leck Kill	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
CoC Carbo	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
CoD Carbo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
CrC Cedarcreek	Severe: small stones.	Severe: small stones.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: small stones.
CrF Cedarcreek	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: small stones, large stones, slope.
CsB Clarksburg	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DEF*:					
Dekalb	Severe: slope, small stones, too acid.	Severe: slope, small stones, too acid.	Severe: slope, small stones, too acid.	Severe: large stones, slope.	Severe: too acid, small stones, large stones.
Hazleton	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, large stones, slope.
EgB Elliber	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
EgC Elliber	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones.
EgD Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones, slope.
ErB Ernest	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, percs slowly.	Moderate: wetness.	Moderate: large stones, wetness.
FrB Frankstown	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
FrC Frankstown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
FrD Frankstown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
FrE Frankstown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Fu Funkstown	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
HaB Hagerstown	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
HaC Hagerstown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
HbB*:					
Hagerstown	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HbB*:					
Carbo	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock, percs slowly.	Slight	Moderate: depth to rock.
HkE*:					
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
HOD*:					
Hazleton	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: too acid, large stones, slope.
Clymer	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: too acid, slope.
HRB*:					
Hazleton	Severe: large stones, too acid.	Severe: large stones, too acid.	Severe: large stones, small stones, too acid.	Moderate: large stones.	Severe: too acid, large stones.
Dekalb	Severe: large stones, small stones, too acid.	Severe: large stones, small stones, too acid.	Severe: large stones, small stones, too acid.	Moderate: large stones.	Severe: too acid, small stones.
HRD*:					
Hazleton	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: too acid, large stones, slope.
Dekalb	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: too acid, small stones, slope.
HRF*:					
Hazleton	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, large stones, slope.
Dekalb	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, small stones, slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HwB---------- Hustontown	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: large stones, wetness.
Jg*:					
Jugtown---------	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Lindside--------	Severe: flooding.	Moderate: flooding, wetness, percs slowly.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
KaB---------- Klinesville	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Slight----------	Severe: small stones, depth to rock.
KaC---------- Klinesville	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Slight----------	Severe: small stones, depth to rock.
KaD---------- Klinesville	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: small stones, slope, depth to rock.
KWF*:					
Klinesville-----	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.	Severe: small stones, slope, depth to rock.
Weikert---------	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
LaB---------- Laidig	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight----------	Moderate: small stones, droughty.
LaC---------- Laidig	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty, slope.
LbB---------- Laidig	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Moderate: large stones.	Moderate: small stones, large stones, droughty.
LbD---------- Laidig	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LCE*:					
Laidig	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Hazleton	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, large stones, slope.
Ln Lindside	Severe: flooding.	Moderate: flooding, wetness, percs slowly.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding
Me Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Mo Monongahela	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
MrB Murrill	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
MuC Murrill	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
MvD Murrill	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: slope.
PcB Pecktonville	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones, large stones.
PcC Pecktonville	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, slope.
PeE*:					
Pecktonville	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Pg Penlaw	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ph---------- Philo	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness, flooding.	Moderate: wetness.	Moderate: wetness, droughty, flooding.
Po---------- Pope	Severe: flooding.	Slight----------	Moderate: small stones, flooding.	Slight----------	Moderate: flooding.
Pu---------- Purdy	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
Q*---------- Quarries	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----------	Severe: depth to rock.
SeB---------- Sideling	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones.
SeC---------- Sideling	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones.
SeD---------- Sideling	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
SrB---------- Sideling	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: large stones, small stones.	Slight----------	Severe: small stones.
SrD---------- Sideling	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: slope.	Severe: small stones, slope.
SSF*: Sideling--------	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Hazleton--------	Severe: slope, large stones, too acid.	Severe: slope, large stones, too acid.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: too acid, large stones, slope.
Ty---------- Tyler	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Uu*: Urban land------	Variable----------	Variable----------	Variable----------	Variable----------	Variable.
Udorthents------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
WrB*: Weikert---------	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Slight----------	Severe: small stones, depth to rock.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WrB*:					
Berks	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight	Severe: small stones, droughty.
WrC*:					
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: small stones, depth to rock.
Berks	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones, droughty.
WrD*:					
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: small stones, droughty, slope.
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, droughty, slope.
WuB*:					
Wurno	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Severe: droughty.
Nollville	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
WuC*:					
Wurno	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
Nollville	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
WuD*:					
Wurno	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
Nollville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
WuE*:					
Wurno	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
Nollville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

* 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)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AgB---- Allegheny	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AnB---- Andover	Poor	Fair	Good	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
AoB---- Andover	Very poor.	Poor	Good	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
As---- Atkins	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Be---- Barbour	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bf---- Basher	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
BhB---- Bedington	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BhC---- Bedington	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BhD---- Bedington	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BkB---- Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BkC---- Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BkD---- Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BrA---- Brinkerton	Poor	Fair	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
BrB---- Brinkerton	Poor	Fair	Good	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
BuB---- Buchanan	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BuC---- Buchanan	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BxB---- Buchanan	Very poor.	Very poor.	Good	Good	Good	Good	Fair	Very poor.	Poor	Fair	Poor.
BxD---- Buchanan	Very poor.	Very poor.	Good	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
CaB---- Calvin	Fair	Good	Good	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CaC--Calvin	Fair	Good	Good	Fair	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CaD--Calvin	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CkB*:											
Calvin	Fair	Good	Good	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Leck Kill	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoC--Carbo	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CoD--Carbo	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CrC--Cedarcreek	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
CrF--Cedarcreek	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
CsB--Clarksburg	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DEF*:											
Dekalb	Very poor.	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Hazleton	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
EgB--Elliber	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EgC--Elliber	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EgD--Elliber	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EgD--Ernest	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
FrB--Frankstown	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FrC--Frankstown	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FrD--Frankstown	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FrE--Frankstown	Very poor.	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
Fu---------- Funkstown	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HaB---------- Hagerstown	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HaC---------- Hagerstown	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HbB*:											
Hagerstown------	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Carbo----------	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HkE*:											
Hagerstown------	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
HOD*:											
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Clymer----------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
HRB*:											
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
Dekalb----------	Very poor.	Very poor.	Good	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
HRD*:											
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb----------	Very poor.	Very poor.	Good	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HRF*:											
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb----------	Very poor.	Very poor.	Good	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HwB---------- Hustontown	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Jg*:											
Jugtown---------	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Lindside--------	Poor	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.

See foonote at end of table.

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
KaB---------- Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
KaC---------- Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
KaD---------- Klinesville	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
KWF*:											
Klinesville-----	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Weikert---------	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
LaB---------- Laidig	Fair	Good	Good	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
LaC---------- Laidig	Fair	Good	Good	Fair	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Lbb---------- Laidig	Very poor.	Very poor.	Good	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
LbD---------- Laidig	Very poor.	Very poor.	Good	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
LCE*:											
Laidig----------	Very poor.	Very poor.	Good	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ln---------- Lindside	Poor	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Me---------- Melvin	Very poor.	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MoB---------- Monongahela	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MrB---------- Murrill	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MrC---------- Murrill	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MvD---------- Murrill	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
PcB---------- Pecktonville	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PcC---------- Pecktonville	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
PeE*:											
Pecktonville----	Very poor.	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Pg---------- Penlaw	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ph---------- Philo	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Po---------- Pope	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pu---------- Purdy	Poor	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Q*---------- Quarries	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
SeB---------- Sideling	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SeC---------- Sideling	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SeD---------- Sideling	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SrB---------- Sideling	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SrD---------- Sideling	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SSF*:											
Sideling--------	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hazleton--------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ty---------- Tyler	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Uu*:											
Urban land.											
Udorthents.											
WeB*:											
Weikert---------	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Berks----------	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
WeC*:											
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WeD*:											
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WuB*:											
Wurno	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Nollville	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WuC*:											
Wurno	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Nollville	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WuD*:											
Wurno	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Nollville	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WuE*:											
Wurno	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Nollville	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Building Site Development

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AgB---- Allegheny	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
AnB---- Andover	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
AoB---- Andover	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
As---- Atkins	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
Be---- Barbour	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Bf---- Basher	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: wetness, flooding.
BhB---- Bedington	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
BhC---- Bedington	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope.
BhD---- Bedington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BkB---- Berks	Moderate: depth to rock, large stones.	Slight	Moderate: depth to rock, large stones.	Moderate: slope.	Moderate: frost action.	Severe: small stones, droughty.
BkC---- Berks	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
BkD---- Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
BrA---- Brinkerton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
BrB---- Brinkerton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
BuB---- Buchanan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Severe: small stones.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BuC---------- Buchanan	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Severe: small stones.
BxB---------- Buchanan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Severe: too acid, small stones.
BxD---------- Buchanan	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: too acid, small stones, slope.
CaB---------- Calvin	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones, droughty.
CaC---------- Calvin	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, droughty.
CaD----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CkB*:						
Calvin---------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones, droughty.
Leck Kill------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
CoC---------- Carbo	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope, depth to rock.
CoD---------- Carbo	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
CrC---------- Cedarcreek	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Severe: small stones.
CrF---------- Cedarcreek	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, large stones, slope.
CsB---------- Clarksburg	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Moderate: shrink-swell, low strength, wetness.	Moderate: wetness.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DEP*:						
Dekalb	Severe: depth to rock, large stones, slope.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: too acid, small stones, large stones.
Hazleton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
EgB	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Severe: small stones.
EgC	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Severe: small stones.
EgD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
ErB	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: large stones, wetness.
FrB	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones.
FrC	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
FrD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
FrE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Fu	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
HaB	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
HaC	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
HbB*:						
Hagerstown	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HbB*:						
Carbo	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: depth to rock.
HkE*:						
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
HOD*:						
Hazleton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
Clymer	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.
HRB*:						
Hazleton	Severe: cutbanks cave.	Moderate: large stones.	Moderate: depth to rock, large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Severe: too acid, large stones.
Dekalb	Severe: depth to rock, cutbanks cave.	Moderate: depth to rock, large stones.	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Moderate: depth to rock, large stones.	Severe: too acid, small stones.
HRD*:						
Hazleton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
Dekalb	Severe: depth to rock, cutbanks cave, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: too acid, small stones, slope.
HRF*:						
Hazleton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
Dekalb	Severe: depth to rock, cutbanks cave, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: too acid, small stones, slope.
HwB	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: large stones, wetness.
Hustontown						

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Jg*:						
Jugtown	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: frost action.	Moderate: wetness.
Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
KaB*:						
Klinesville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: small stones, depth to rock.
Calvin	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones, droughty.
KaC*:						
Klinesville	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: small stones, depth to rock.
Calvin	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, droughty.
KaD*:						
Klinesville	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope, depth to rock.
Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
KWF*:						
Klinesville	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope, depth to rock.
Weikert	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
LaB	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty.
LaC	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LbB---------- Laidig	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones, droughty.
LbD---------- Laidig	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LCE*:						
Laidig---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Hazleton-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
Ln---------- Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
Me---------- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
MoB---------- Monongahela	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness, frost action.	Moderate: wetness.
MrB---------- Murrill	Moderate: too clayey.	Slight---------	Slight	Moderate: slope.	Moderate: low strength, frost action.	Moderate: small stones.
MrC---------- Murrill	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: small stones, slope.
MvD---------- Murrill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PcB---------- Pecktonville	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Severe: shrink-swell	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: small stones, large stones.
PcC---------- Pecktonville	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: small stones, large stones, slope.
PeE*:						
Pecktonville---	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Rock outcrop---	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Pg--- Penlaw	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
Ph--- Philo	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, droughty, flooding.
Po--- Pope	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Pu--- Purdy	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength, ponding, frost action.	Severe: ponding.
Q*--- Quarries	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
SeB--- Sideling	Moderate: wetness.	Slight---	Moderate: wetness.	Moderate: slope.	Moderate: frost action.	Severe: small stones.
SeC--- Sideling	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Severe: small stones.
SeD--- Sideling	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
SrB--- Sideling	Moderate: wetness.	Slight---	Moderate: wetness.	Moderate: slope.	Moderate: frost action.	Severe: small stones.
SrD--- Sideling	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
SSF*:						
Sideling---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Hazleton---	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, large stones, slope.
Ty:						
Tyler---	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
Uu*:						
Urban land---	Variable---	Variable---	Variable---	Variable---	Variable---	Variable.
Udorthents---	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WeB:						
Weikert	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: small stones, depth to rock.
WeC:						
Weikert	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: small stones, depth to rock.
WeD:						
Weikert	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
WuB*:						
Wurno	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Severe: droughty.
Nollville	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones.
WuC*:						
Wurno	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Severe: droughty.
Nollville	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
WuE*:						
Wurno	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Nollville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Sanitary Facilities

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AgB Allegheny	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
AnB: Andover	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
AoB Andover	Severe: wetness, percs slowly.	Moderate: seepage, large stones	Severe: wetness.	Severe: wetness.	Poor: small stones, wetness.
As Atkins	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
Be Barbour	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Slight.
Bf Basher	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: small stones, wetness, thin layer.
BhB Bedington	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BhC Bedington	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BhD Bedington	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
BkB Berks	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
BkC Berks	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
BkD Berks	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
BrA Brinkerton	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BrB Brinkerton	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
BuB: Buchanan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness, too acid	Moderate: wetness.	Poor: small stones, too acid.
BuC: Buchanan	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too acid	Moderate: wetness, slope.	Poor: small stones, too acid.
BxB: Buchanan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness, too acid	Moderate: wetness.	Poor: small stones, too acid.
BxD: Buchanan	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness, slope, too acid	Severe: slope.	Poor: small stones, slope, too acid.
CaB: Calvin	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
CaC: Calvin	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
CaD: Calvin	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
CkB*: Calvin	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Leck Kill	Moderate: depth to rock, percs slowly.	Severe: seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
CoC: Carbo	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CoD:					
Carbo	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
CrC	Moderate: percs slowly, slope, large stones	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
CrF	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
CsB	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Moderate: wetness.	Fair: too clayey, small stones, wetness.
DEF*:					
Dekalb	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Hazleton	Severe: poor filter, slope.	Severe: seepage, slope, large stones	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
EgB	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too acid.	Severe: seepage.	Poor: seepage, small stones, too acid.
EgC	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too acid.	Severe: seepage.	Poor: seepage, small stones, too acid.
EgD	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
ErB	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, small stones, wetness.
FrB	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack, small stones.
FrC	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack, small stones.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FrD--- Frankstown	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
FrE--- Frankstown	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
Fu--- Funkstown	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
HaB--- Hagerstown	Moderate: depth to rock, percs slowly.	Moderate: seepage, slope.	Severe: depth to rock, too clayey.	Slight---	Poor: too clayey, hard to pack.
HaC--- Hagerstown	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
HbB*: Hagerstown---	Moderate: depth to rock, percs slowly.	Moderate: seepage, slope.	Severe: depth to rock, too clayey.	Slight---	Poor: too clayey, hard to pack.
Carbo---	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
HkE*: Hagerstown---	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Rock outcrop----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
HOD*: Hazleton---	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
Clymer---	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too acid.	Severe: slope.	Poor: small stones, slope, too acid.
HRB*: Hazleton---	Severe: poor filter.	Severe: seepage, large stones.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: small stones, too acid.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HRB*:					
Dekalb	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, large stones.	Severe: depth to rock, seepage, large stones.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones, too acid.
HRD*:					
Hazleton	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
Dekalb	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HRP*:					
Hazleton	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
Dekalb	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HwB	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too acid.	Moderate: wetness.	Poor: small stones.
Jg*:					
Jugtown	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: small stones.
Lindside	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
KaB	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
KaC	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
KaD	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
KWF*:					
Klinesville	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.
Weikert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.
LaB	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: too acid	Severe: seepage.	Poor: small stones, too acid.
LaC	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Severe: too acid	Severe: seepage.	Poor: small stones, too acid.
LbB	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, large stones.	Severe: seepage.	Poor: small stones.
LbD	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: seepage, slope.	Poor: small stones, slope.
LCE*:					
Laidig	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: slope.	Severe: seepage, slope.	Poor: small stones, slope.
Hazleton	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
Ln	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Me	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
MoB	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, small stones, wetness.
MrB	Moderate: depth to rock, percs slowly.	Moderate: seepage, slope.	Severe: depth to rock.	Slight	Fair: too clayey, small stones.

See foonote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MrC---------- Murrill	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: too clayey, small stones, slope.
MvD---------- Murrill	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
PcB---------- Pecktonville	Severe: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack, small stones.
PcC---------- Pecktonville	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack, small stones.
PeE*:					
Pecktonville----	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: too clayey, hard to pack.
Rock outcrop----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Pg---------- Penlaw	Severe: wetness, percs slowly.	Moderate: seepage, depth to rock.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Ph---------- Philo	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, depth to rock, seepage.	Severe: flooding, seepage, wetness.	Poor: too sandy, small stones.
Po---------- Pope	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Good.
Pu---------- Purdy	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey, too acid.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Q*---------- Quarries	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
SeB---------- Sideling	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: small stones.
SeC---------- Sideling	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Poor: small stones.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SeD--- Sideling	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
SrB--- Sideling	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: small stones.
SrD--- Sideling	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
SSF*:					
Sideling	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Hazleton	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope, too acid.
Ty--- Tyler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Uu*:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Udorthents	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: thin layer.
WeB--- Weikert	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
WeC--- Weikert	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
WeD--- Weikert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.
WuB*:					
Wurno	Severe: depth to rock.	Severe: depth to rock	Severe: depth to rock.	Severe: depth to rock	Poor: depth to rock, small stones
Nollville	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock	Poor: too clayey, hard to pack.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WuC*:					
Wurno	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock	Poor: depth to rock, small stones.
Nollville	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
WuD*:					
Wurno	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Nollville	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: too clayey, hard to pack.
WuE:					
Wurno	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope
Nollville	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: too clayey, hard to pack.

* 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," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AgB---- Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
AnB---- Andover	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
AoB---- Andover	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
As---- Atkins	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Be---- Barbour	Good	Probable	Probable	Poor: small stones, area reclaim.
Bf---- Basher	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
BhB---- Bedington	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BhC---- Bedington	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BhD---- Bedington	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BkB---- Berks	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BkC---- Berks	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BkD---- Berks	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
BrA---- Brinkerton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
BrB---- Brinkerton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
BuB---- Buchanan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
BuC---- Buchanan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
BxB---- Buchanan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
BxD---- Buchanan	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
CaB---- Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CaC---- Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CaD---- Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CkB*:				
Calvin----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Leck Kill----	Fair: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CoC---- Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CoD---- Carbo	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
CrC---- Cedarcreek	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CrF---- Cedarcreek	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
CsB---------- Clarksburg	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
DEF*:				
Dekalb----------	Poor: depth to rock, large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too acid, slope.
Hazleton--------	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
EgB---------- Elliber	Fair: large stones.	Probable----------	Probable----------	Poor: small stones, area reclaim, too acid.
EgC---------- Elliber	Fair: large stones.	Probable----------	Probable----------	Poor: small stones, area reclaim, too acid.
EgD---------- Elliber	Fair: large stones, slope.	Probable----------	Probable----------	Poor: small stones, area reclaim, too acid.
ErB---------- Ernest	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
FrB---------- Frankstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
FrC---------- Frankstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
FrD---------- Frankstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
FrE---------- Frankstown	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Fu---------- Funkstown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
HaB---------- Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HaC---------- Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
HbB*:				
Hagerstown------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Carbo----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HkE*:				
Hagerstown------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Rock outcrop----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
HOD*:				
Hazleton--------	Fair: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
Clymer----------	Fair: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
HRB*:				
Hazleton--------	Fair: depth to rock, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
Dekalb----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too acid.
HRD*:				
Hazleton--------	Fair: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
Dekalb----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too acid, slope.
HRF*:				
Hazleton--------	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HRF*:				
Dekalb	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too acid, slope.
HwB	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
Jg*:				
Jugtown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Lindside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
KaB	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones.
KaC	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones.
KaD*:				
Klinesville	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
KWF*:				
Klinesville	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Weikert	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
LaB	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
LaC	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too acid.
LbB	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
LbD---------- Laidig	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
LCE*:				
Laidig----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Hazleton--------	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
Ln---------- Lindside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
Me:				
Melvin----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MoB---------- Monongahela	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MrB---------- Monongahela	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MrC:				
Murrill---------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MvD:				
Murrill---------	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
PcB---------- Pecktonville	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
PcC---------- Pecktonville	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
PeE*:				
Pecktonville----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Pg---Penlaw	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ph---Philo	Fair: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Po---Pope	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Pu---Purdy	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, too acid.
Q*---Quarries	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
SeB---Sideling	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SeC---Sideling	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SeD---Sideling	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SrB---Sideling	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SrD---Sideling	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SSF*:				
Sideling	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Hazleton	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, too acid.
Ty---Tyler	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Uu*:				
Urban land	Variable	Variable	Variable	Variable.
Udorthents	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
WeB---------- Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones.
WeC---------- Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones.
WeD---------- Weikert	Poor: depth to rock.	Improbable: small stones.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
WuB*:				
Wurno----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Nollville-------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
WuC*:				
Wurno----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Nollville-------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
WuD*:				
Wurno----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Nollville-------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
WuE*:				
Wurno----------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Nollville-------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Water Management

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AgB---------- Allegheny	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Favorable------	Favorable.
AnB---------- Andover	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Slope, wetness, droughty.	Large stones, wetness, rooting depth.	Large stones, wetness, droughty.
AoB---------- Andover	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, droughty, percs slowly.	Large stones, wetness, rooting depth.	Large stones, wetness, droughty.
As---------- Atkins	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
Be---------- Barbour	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water--	Droughty, flooding.	Favorable------	Droughty.
Bf---------- Basher	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Flooding, frost action.	Wetness, flooding.	Wetness--------	Favorable.
BhB---------- Bedington	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Large stones---	Large stones.
BhC---------- Bedington	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Slope---------- large stones.	Large stones, slope.
BhD---------- Bedington	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope, large stones.	Slope, large stones.	Large stones, slope.
BkB---------- Berks	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
BkC---------- Berks	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
BkD---------- Berks	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
BrA---------- Brinkerton	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth	Wetness, erodes easily, rooting depth
BrB---------- Brinkerton	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, subsides, frost action.	Slope, wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
BuB---------- Buchanan	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope, too acid.	Slope, wetness, droughty.	Large stones, wetness, rooting depth.	Large stones, droughty, rooting depth.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
BuC--Buchanan	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope, too acid.	Slope, wetness, droughty.	Slope, large stones, wetness.	Large stones, slope, droughty.
BxB--Buchanan	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Large stones, wetness, rooting depth.	Large stones, droughty, rooting depth.
BxD--Buchanan	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, large stones, wetness.	Large stones, slope, droughty.
CaB--Calvin	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Depth to rock--	Droughty, depth to rock.
CaC--Calvin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty.
CaD--Calvin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty.
CkB*:							
Calvin	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Depth to rock--	Droughty, depth to rock.
Leck Kill	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Slope	Favorable	Favorable.
CoC--Carbo	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
CoD--Carbo	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
CrC--Cedarcreek	Severe: seepage, slope.	Moderate: large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
CrF--Cedarcreek	Severe: seepage, slope.	Moderate: large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
CsB--Clarksburg	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
DEF*:							
Dekalb	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
EgB---- Elliber	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Large stones.	Large stones, droughty.
EgC---- Elliber	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
EgD---- Elliber	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
ErB---- Ernest	Moderate: seepage.	Severe: piping.	Severe: no water.	Percs slowly---	Wetness, percs slowly, rooting depth.	Large stones, erodes easily, wetness.	Large stones, erodes easily, rooting depth.
FrB---- Frankstown	Moderate: seepage, depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Favorable------	Favorable.
FrC---- Frankstown	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
FrD---- Frankstown	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
FrE---- Frankstown	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
Fu---- Funkstown	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Flooding-------	Wetness, flooding.	Wetness--------	Favorable.
HaB---- Hagerstown	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Favorable------	Favorable.
HaC---- Hagerstown	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
HbB*:							
Hagerstown------	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Favorable------	Favorable.
Carbo----------	Moderate: depth to rock, slope.	Severe: hard to pack.	Severe: no water.	Deep to water--	Slope, percs slowly, depth to rock.	Depth to rock, erodes easily, percs slowly.	Erodes easily, depth to rock, percs slowly.
HkE*:							
Hagerstown------	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
Rock outcrop----	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: no water.	Deep to water--	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
HOD*:							
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Clymer	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, too acid.	Slope, large stones.	Large stones, slope, droughty.
HRB*:							
Hazleton	Severe: seepage.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Large stones	Large stones, droughty.
Dekalb	Severe: seepage.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
HRD*:							
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
HRF*:							
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
HwB Hustontown	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Frost action, slope, too acid.	Slope, wetness, rooting depth.	Wetness, rooting depth.	Rooting depth.
Jg*:							
Jugtown	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
Lindside	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Erodes easily.
KaB Klinesville	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
KaC Klinesville	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
KaD Klinesville	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.

See foootnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
KWF*:							
Klinesville	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Weikert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
LaB	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, slope, too acid.	Slope, wetness, droughty.	Large stones, wetness, rooting depth.	Large stones, droughty, rooting depth.
LaC	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope, too acid.	Slope, wetness, droughty.	Slope, large stones, wetness.	Large stones, slope, droughty.
LbB	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Large stones, wetness, rooting depth.	Large stones, droughty, rooting depth.
LbD	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, large stones, wetness.	Large stones, slope, droughty.
LCE*:							
Laidig	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, large stones, wetness.	Large stones, slope, droughty.
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Ln:							
Lindside	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Erodes easily.
Me	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
MoB	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
MrB	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Favorable------	Favorable.
MrC	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Slope----------	Slope.
MvD	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water--	Slope----------	Slope, large stones.	Large stones, slope.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
PcB--Pecktonville	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Deep to water--	Slope, percs slowly.	Percs slowly---	Percs slowly.
PcC--Pecktonville	Severe: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Deep to water--	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
PeE*: Pecktonville----	Severe: depth to rock, slope.	Moderate: piping, hard to pack, wetness.	Severe: slow refill, depth to rock.	Deep to water--	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Rock outcrop----	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: no water.	Deep to water--	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Pg--Penlaw	Moderate: seepage, depth to rock.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
Ph--Philo	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, erodes easily.	Erodes easily, wetness, too sandy.	Erodes easily, droughty.
Po--Pope	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water--	Erodes easily, flooding.	Erodes easily.	Erodes easily.
Pu--Purdy	Slight---	Severe: hard to pack, ponding	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Q*--Quarries	Severe: depth to rock.	Severe: depth to rock.	Severe: no water.	Deep to water--	Slope, depth to rock.	Depth to rock--	Depth to rock.
SeB--Sideling	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Wetness-------	Droughty, percs slowly.
SeC--Sideling	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness.	Slope, droughty, percs slowly.
SeD--Sideling	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness.	Slope, droughty, percs slowly.
SrB--Sideling	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Wetness-------	Droughty, percs slowly.
SrD--Sideling	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness.	Slope, droughty, percs slowly.
SSF*: Sideling--------	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness.	Slope, droughty, percs slowly.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SSP*:							
Hazleton	Severe: seepage, slope.	Severe: piping, large stones.	Severe: no water.	Deep to water--	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Ty Tyler	Slight	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
Uu*:							
Urban land	Variable	Variable	Variable	Variable	Variable	Variable	Variable.
Udorthents	Severe: slope.	Severe: seepage, depth to rock.	Severe: no water.	Deep to water--	Slope	Slope	Slope.
WeB Weikert	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
WeC Weikert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
WeD Weikert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
WuB*:							
Wurno	Moderate: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Depth to rock.	Droughty, depth to rock.
Nollville	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water--	Slope	Favorable	Favorable.
WuC*:							
Wurno	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
NolvilleE	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water--	Slope	Slope	Slope.
WuD*:							
Wurno	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Nollville	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water--	Slope	Slope	Slope.
WuE*:							
Wurno	Severe: slope.	Severe: seepage.	Severe: no water.	Deep to water--	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.

See footnote at end of table.

Table 13.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
WuE*: Nollville	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.

* 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)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AgB----------	0-8	Loam----------	ML, CL	A-4	0	0	90-100	80-100	65-100	55-95	15-35	NP-10
Allegheny	8-42	Clay loam, loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0	0	90-100	80-100	65-95	35-80	15-35	NP-15
	42-65	Clay loam, sandy loam, gravelly sandy loam.	SM, GC, ML, CL	A-4, A-6, A-2, A-1	0	0-5	65-100	55-100	35-95	20-75	15-35	NP-15
AnB----------	0-8	Gravelly silt loam.	SM, ML, GM	A-4, A-2	0	0-5	65-75	65-75	60-70	30-60	20-35	NP-10
Andover	8-19	Loam, gravelly clay loam, cobbly sandy clay loam.	SM, ML, CL-ML, CL	A-4, A-2	0-1	0-20	80-95	65-85	60-85	30-60	20-35	2-10
	19-46	Loam, gravelly clay loam, cobbly sandy clay loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0-1	0-20	80-95	65-85	60-85	30-60	20-35	2-9
	46-65	Gravelly sandy clay loam, cobbly loam, cobbly sandy loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0-1	5-30	70-95	55-90	50-75	25-60	20-35	2-9
AoB----------	0-4	Gravelly loam--	ML, SM, GM	A-4, A-2	0-5	3-10	70-100	65-95	60-90	30-85	20-35	NP-10
Andover	4-19	Loam, gravelly clay loam, cobbly sandy clay loam.	SM, SC, ML, CL-ML	A-4, A-2	0-3	0-25	80-95	65-85	60-80	30-60	20-35	2-10
	19-46	Loam, gravelly clay loam, cobbly sandy clay loam.	SM, ML, SC-SM, CL-ML	A-4, A-2	0-3	0-25	80-95	65-85	60-85	30-60	20-35	2-9
	46-65	Gravelly sandy clay loam, cobbly loam, cobbly sandy loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0-3	5-30	70-95	55-90	50-75	25-60	20-35	2-9
As----------	0-4	Silt loam------	ML, CL, CL-ML	A-4, A-6	0	0	90-100	85-100	75-100	60-95	20-40	3-20
Atkins	4-36	Silty clay loam, silt loam, sandy loam.	SM, SC, ML, CL	A-4, A-6	0	0-5	90-100	85-100	65-100	45-85	20-40	3-20
	36-70	Stratifiedsilty clay loam gravelly sandy loam.	SM, CL, GM, ML	A-2, A-4, A-6	0	0-20	40-100	35-100	25-95	15-85	20-40	1-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Be---------- Barbour	0-6	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4, A-2	0	0	80-100	75-100	50-95	30-90	15-25	2-7
	6-35	Silt loam, fine sandy loam, gravelly loam.	ML, SM, CL-ML, SC-SM	A-4, A-2, A-1	0	0	60-100	55-95	30-95	15-85	15-25	2-7
	35-65	Loamy sand, very gravelly sand, gravelly loamy fine sand.	SM, SP, GM, GP	A-1, A-2, A-3, A-4	0-1	0-5	35-95	30-95	20-80	2-40	15-25	1-7
Bf---------- Basher	0-8	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4, A-2, A-1	0	0-5	80-100	75-100	45-100	20-90	15-25	2-7
	8-22	Silt loam, loam, gravelly sandy loam.	SM, ML, CL-ML, SC-SM	A-4, A-2, A-1	0	0-5	75-100	70-100	40-100	20-90	15-25	2-7
	22-46	Silt loam, gravelly loam, sandy loam.	SM, ML, CL-ML, SC-SM	A-4, A-2, A-1	0	0-5	75-100	70-100	40-100	20-90	15-25	2-7
	46-65	Fine sandy loam, gravelly loamy sand, very gravelly sand.	GP, SW, SM, ML	A-1, A-2, A-4, A-3	0	0-5	30-100	25-100	10-85	1-55	15-25	2-7
BhB---------- Bedington	0-10	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4	0	0-5	50-85	50-80	40-75	30-65	20-35	2-10
	10-43	Silt loam, channery silty clay loam, very channery loam.	GM, SM, ML, SC-SM	A-4, A-2, A-6, A-7	0	0-30	40-90	30-90	25-75	20-65	25-45	5-15
	43-65	Very channery loam, very channery silt loam, extremely channery silt loam.	GM, GM-GC	A-4, A-2, A-1, A-7	0	0-30	20-50	20-45	15-45	15-45	20-45	1-15
BhC---------- Bedington	0-8	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4	0	0-5	50-85	50-80	40-75	30-65	20-35	2-10
	8-52	Silt loam, channery silty clay loam, very channery loam.	GM, SM, ML, SC-SM	A-4, A-2, A-6, A-7	0	0-30	40-90	30-90	25-75	20-65	25-45	5-15
	52-65	Very channery loam, very channery silt loam, extremely channery silt loam.	GM, GM-GC	A-4, A-2, A-1, A-7	0	0-30	20-50	20-45	15-45	15-45	20-45	1-15

See fotnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BhD---------- Bedington	0-6	Channery silt loam.	GM, SM, ML, CL-ML	A-2, A-4	0	0-5	50-85	50-80	40-75	30-65	20-35	2-10
	6-52	Silt loam, channery silty clay loam, very channery loam.	GM, SM, ML, SC-SM	A-4, A-2, A-6, A-7	0	0-30	40-90	30-90	25-75	20-65	25-45	5-15
	52-65	Very channery loam, very channery silt loam, extremely channery silt loam.	GM, GM-GC	A-4, A-2, A-1, A-7	0	0-30	20-50	20-45	15-45	15-45	20-45	1-15
BkB---------- Berks	0-8	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0	0-15	50-80	45-70	40-60	30-55	25-36	5-10
	8-26	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	26-36	Channery loam, very channery loam, channery silt loam.	GM, SM, GM-GC	A-1, A-2	0	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	36-46	Weathered bedrock.			0	0	0	0	0	0	---	NP
BkC---------- Berks	0-8	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0	0-15	50-80	45-70	40-60	30-55	25-36	5-10
	8-26	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	26-36	Channery loam, very channery loam, channery silt loam.	GM, SM, GM-GC	A-1, A-2	0	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	36-46	Weathered bedrock.			0	0	0	0	0	0	---	NP
BkD---------- Berks	0-6	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0	0-15	50-80	45-70	40-60	30-55	25-36	5-10
	6-26	Channery loam, very channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	26-36	Channery loam, very channery loam, channery silt loam.	GM, SM, GM-GC	A-1, A-2	0	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	36-46	Weathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BrA--- Brinkerton	0-9	Silt loam---	ML	A-4, A-6, A-7-6	0	0-10	90-100	85-100	85-100	75-100	30-45	5-15
	9-18	Silty clay loam, silt loam.	ML	A-4, A-6, A-7	0	0-10	90-100	85-100	85-100	65-100	30-45	5-15
	18-46	Silt loam, channery loam, channery silty clay loam.	ML	A-4, A-6, A-7	0	0-10	75-100	60-100	60-100	55-100	30-45	5-15
	46-65	Silt loam, channery loam, channery silt loam.	ML, SM, SC, CL	A-4, A-6, A-2, A-1	0	0-50	70-90	25-85	25-85	20-75	30-40	5-15
BrB--- Brinkerton	0-9	Silt loam---	ML	A-4, A-6, A-7-6	0	0-10	90-100	85-100	85-100	75-100	30-45	5-15
	9-18	Silty clay loam, silt loam.	ML	A-4, A-6, A-7	0	0-10	90-100	85-100	85-100	65-100	30-45	5-15
	18-46	Silt loam, channery loam, channery silty clay loam.	ML	A-4, A-6, A-7	0	0-10	75-100	60-100	60-100	55-100	30-45	5-15
	46-65	Silt loam, channery loam, channery silt loam.	ML, SM, SC, CL	A-4, A-6, A-2, A-1	0	0-50	70-90	25-85	25-85	20-75	30-40	5-15
BuB--- Buchanan	0-8	Gravelly loam--	GM, ML, CL, CL-ML	A-4, A-2, A-6	0	0-10	50-100	45-75	40-75	30-65	20-35	2-11
	8-32	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	32-65	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0	0-20	50-100	30-80	30-75	20-60	20-35	2-15
BuC--- Buchanan	0-6	Gravelly loam--	GM, ML, CL, CL-ML	A-4, A-2, A-6	0	0-10	50-100	45-75	40-75	30-65	20-35	2-11
	6-21	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	21-65	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-4, A-2, A-6	0	0-20	50-100	30-80	30-75	20-60	20-35	2-15
BxB--- Buchanan	0-4	Cobbly loam---	GM, ML, CL, CL-ML	A-2, A-4, A-6	6-20	5-20	50-85	45-70	40-70	30-60	20-35	2-11
	4-30	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-3	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	30-65	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-3	0-20	50-100	30-80	30-75	20-60	20-35	2-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BxD---------- Buchanan	0-4	Cobbly loam----	GM, ML, CL, CL-ML	A-2, A-4, A-6	6-20	5-20	50-85	45-70	40-70	30-60	20-35	2-11
	4-30	Gravelly loam, silt loam, gravelly sandy clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-3	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	30-65	Gravelly loam, loam, channery clay loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-3	0-20	50-100	30-80	30-75	20-60	20-35	2-15
CaB---------- Calvin	0-8	Channery loam--	ML, CL-ML	A-4	0	0-15	70-95	70-90	65-90	55-75	15-30	2-10
	8-30	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0	0-15	70-95	55-90	40-90	30-75	22-38	2-11
	30-35	Extremely channery silt loam, very channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0	0-20	35-75	15-45	15-45	15-40	23-39	3-13
	35-45	Weathered bedrock.			0	0	0	0	0	0	---	NP
CaC---------- Calvin	0-8	Channery loam--	ML, CL-ML	A-4	0	0-15	70-95	70-90	65-90	55-75	15-30	2-10
	8-30	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0	0-15	70-95	55-90	40-90	30-75	22-38	2-11
	30-35	Extremely channery silt loam, very channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0	0-20	35-75	15-45	15-45	15-40	23-39	3-13
	35-45	Weathered bedrock.			0	0	0	0	0	0	---	NP
CaD---------- Calvin	0-6	Channery loam--	ML, CL-ML	A-4	0	0-15	70-95	70-90	65-90	55-75	15-30	2-10
	6-30	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0	0-15	70-95	55-90	40-90	30-75	22-38	2-11
	30-35	Extremely channery silt loam, very channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0	0-20	35-75	15-45	15-45	15-40	23-39	3-13
	35-45	Weathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CkB*:												
Calvin	0-8	Channery silt loam.	ML, CL-ML	A-4	0	0-15	70-95	70-90	65-90	55-75	15-30	2-10
	8-30	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0	0-15	70-95	55-90	40-90	30-75	22-38	2-11
	30-35	Extremely channery silt loam, very channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0	0-20	35-75	15-45	15-45	15-40	23-39	3-13
	35-45	Weathered bedrock.			0	0	0	0	0	0	---	NP
Leck Kill	0-9	Channery silt loam.	SM, ML, GM, CL-ML	A-4	0	0-5	70-85	60-80	50-80	35-70	14-30	2-10
	9-45	Silt loam, channery loam, channery silty clay loam.	GM, SC, GC, CL-ML	A-4, A-2, A-6	0	0-10	60-90	50-85	40-80	30-70	23-40	2-17
	45-60	Very channery silt loam, very channery clay loam, extremely channery loam.	SM, GM, GP-GM, SP-SM	A-2, A-1	0	0-30	30-70	10-30	8-30	6-25	25-40	2-13
	60-70	Weathered bedrock.			0	0	0	0	0	0	---	NP
CoC	0-8	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-95	75-85	30-50	10-25
Carbo	8-37	Clay	CH	A-7	0	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	37-47	Unweathered bedrock.			0	0	0	0	0	0	---	NP
CoD	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-95	75-85	30-50	10-25
Carbo	7-37	Clay	CH	A-7	0	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	37-47	Unweathered bedrock.			0	0	0	0	0	0	---	NP
CrC	0-3	Very channery loam.	GC	A-2, A-4, A-6	0	15-30	45-60	40-55	30-50	20-40	25-35	7-12
Cedarcreek	3-60	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	0	5-30	30-55	25-50	20-45	15-40	25-35	7-12
CrF	0-3	Extremely channery loam.	GC	A-2, A-4, A-6	0	20-40	45-60	40-55	30-50	20-40	25-35	7-12
Cedarcreek	3-60	Extremely channery loam, very stony silt loam, very channery sandy loam.	GC	A-2, A-4	0	5-30	30-55	25-50	20-45	15-40	25-35	7-12

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CsB---------- Clarksburg	0-10	Silt loam------	CL, ML	A-4, A-6	0	0-5	90-100	85-100	80-95	75-90	25-35	2-11
	10-32	Loam, channery silty clay loam, gravelly silt loam.	CL, CL-ML	A-4, A-6, A-7	0	0-10	80-100	65-100	60-95	55-85	25-45	6-20
	32-48	Silty clay loam, channery loam, gravelly silt loam.	CL-ML, CL, SC-SM, SC	A-4, A-6, A-7	0	0-15	75-100	55-100	50-95	45-90	20-45	4-20
	48-65	Clay, channery loam, silty clay loam.	CL, CH, SC-SM, GC	A-4, A-6, A-7, A-2	0	0-20	50-100	20-100	15-95	15-90	20-52	4-25
DEP*:												
Dekalb----------	0-7	Cobbly loam----	SM, GM, ML, CL-ML	A-2, A-4	10-60	50-85	50-90	45-80	40-75	20-55	15-32	NP-7
	7-28	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML	A-2, A-4	0-10	5-40	50-85	40-80	40-75	20-55	15-32	NP-7
	28-32	Channery sandy loam, flaggy sandy loam, very flaggy sandy loam.	SM, GM, SC, GC	A-2, A-4	0-20	10-50	45-85	35-75	25-65	15-40	15-32	NP-9
	32-42	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP
EgB---------- Elliber	0-8	Very channery silt loam.	GM, GP-GM	A-2, A-1	0	0-15	30-60	20-55	15-45	10-30	15-30	NP-7
	8-65	Channery silt loam, very channery sandy loam, extremely channery silt loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	0	10-30	40-65	30-60	25-50	5-40	20-35	NP-7
EgC---------- Elliber	0-8	Very channery silt loam.	GM, GP-GM	A-2, A-1	0	0-15	30-60	20-55	15-45	10-30	15-30	NP-7
	8-65	Channery silt loam, very channery sandy loam, extremely channery silt loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	0	10-30	40-65	30-60	25-50	5-40	20-35	NP-7

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EgD---------- Elliber	0-10	Very channery silt loam.	GM, GP-GM	A-2, A-1	0	0-15	30-60	20-55	15-45	10-30	15-30	NP-7
	10-65	Channery silt loam, very channery sandy loam, extremely channery silt loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	0	10-30	40-65	30-60	25-50	5-40	20-35	NP-7
ErB---------- Ernest	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0-10	85-100	80-100	70-95	60-95	20-40	4-15
	7-27	Silty clay loam, silt loam, channery silt loam.	CL, CL-ML	A-4, A-6, A-7	0-5	0-15	75-100	70-100	65-90	55-90	25-50	6-22
	27-43	Channery silt loam, channery loam, silty clay loam.	ML, CL, GM, SC-SM	A-4, A-6, A-7	0-5	0-20	70-95	55-95	55-90	45-90	20-45	4-18
	43-65	Channery silt loam, silt loam, silty clay loam.	GC, CL, SC-SM	A-4, A-6, A-7	0-5	0-20	70-95	45-95	45-90	40-90	25-50	6-22
FrB---------- Frankstown	0-9	Channery silt loam.	ML, CL-ML	A-4, A-6	0	0	75-100	70-85	65-80	60-80	25-40	4-12
	9-16	Channery silty clay loam, silt loam.	ML, CL, CH, GC	A-6, A-7	0	0	60-100	55-100	50-100	45-95	25-50	11-23
	16-37	Channery silty clay loam, channery silt loam, channery clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
	37-65	Very channery silt loam, silty clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
FrC---------- Frankstown	0-9	Channery silt loam.	ML, CL-ML	A-4, A-6	0	0	75-100	70-85	65-80	60-80	25-40	4-12
	9-16	Channery silty clay loam, silt loam.	ML, CL, CH, GC	A-6, A-7	0	0	60-100	55-100	50-100	45-95	25-50	11-23
	16-37	Channery silty clay loam, channery silt loam, channery clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
	37-65	Very channery silt loam, silty clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FrD---------- Frankstown	0-7	Channery silt loam.	ML, CL-ML	A-4, A-6	0	0	75-100	70-85	65-80	60-80	25-40	4-12
	7-16	Channery silty clay loam, silt loam.	ML, CL, CH, GC	A-6, A-7	0	0	60-100	55-100	50-100	45-95	25-50	11-23
	16-37	Channery silty clay loam, channery silt loam, channery clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
	37-65	Very channery silt loam, silty clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
FrE---------- Frankstown	0-3	Channery silt loam.	ML, CL-ML	A-4, A-6	0	0	75-100	70-85	65-80	60-80	25-40	4-12
	3-16	Channery silty clay loam, silt loam.	ML, CL, CH, GC	A-6, A-7	0	0	60-100	55-100	50-100	45-95	25-50	11-23
	16-37	Channery silty clay loam, channery silt loam, channery clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
	37-65	Very channery silt loam, silty clay.	MH, CL, CH, GC	A-6, A-7	0	0-5	45-100	40-95	40-95	35-95	30-65	11-35
Fu---------- Funkstown	0-15	Silt loam------	ML, CL	A-4, A-6	0	0	95-100	85-100	80-100	65-80	15-30	3-11
	15-24	Gravelly silt loam, gravelly silty clay loam, very gravelly loam.	ML, CL, SM	A-2, A-4, A-6	0	0	65-90	60-85	55-80	30-70	15-35	3-15
	24-52	Silty clay loam, clay loam, loam.	CL, ML	A-4, A-6, A-7	0	0	95-100	90-100	80-90	65-80	20-45	3-20
	52-74	Channery silt loam, channery silty clay loam, channery loam.	CL, ML	A-4, A-6, A-7	0	0	65-90	60-85	55-80	50-70	20-45	3-20
HaB---------- Hagerstown	0-10	Silt loam------	CL, CL-ML	A-4, A-6, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	10-17	Clay, clay loam.	CL, CH	A-7	0	0-5	90-100	80-100	75-100	55-95	48-65	26-34
	17-71	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
HaC---------- Hagerstown	0-7	Silt loam------	CL, CL-ML	A-4, A-6, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	7-14	Clay, clay loam.	CL, CH	A-7	0	0-5	90-100	80-100	75-100	55-95	48-65	26-34
	14-68	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HbB*:												
Hagerstown------	0-8	Silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	8-21	Clay, clay loam.	CL, CH	A-7	0	0-5	90-100	80-100	75-100	55-95	48-65	26-34
	21-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-1	0-5	85-100	80-100	75-100	75-95	30-70	15-40
Carbo----------	0-10	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-95	75-85	30-50	10-25
	10-37	Clay----------	CH	A-7	0	0-5	95-100	85-100	80-95	70-90	60-80	35-55
	37-47	Unweathered bedrock.			0	0	0	0	0	0	---	NP
HkE*:												
Hagerstown------	0-5	Silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	5-9	Clay, clay loam.	CL, CH	A-7	0	0-5	90-100	80-100	75-100	55-95	48-65	26-34
	9-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-2	0-5	85-100	80-100	75-100	75-95	30-70	15-40
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
HOD*:												
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Clymer----------	0-10	Channery loam--	ML, SM, GM, SC-SM	A-4, A-2	5-20	15-30	60-100	50-95	45-90	30-85	15-30	NP-9
	10-39	Sandy loam, channery loam, channery clay loam.	GM, SM, GC, ML	A-2, A-4	0-5	0-20	60-95	50-95	45-85	30-60	15-32	NP-9
	39-56	Channery loam, very channery loam, channery sandy loam.	GM, GP-GM, GC, SM	A-1, A-2, A-3, A-4	0-5	10-30	30-75	25-70	20-60	5-40	15-32	NP-9
	56-66	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HRB*:												
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Dekalb----------	0-7	Cobbly sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	6-20	15-30	50-90	45-80	40-75	20-55	15-32	NP-10
	7-28	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	0	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	28-32	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	0-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	32-42	Unweathered bedrock.			0	0	0	0	0	0	---	NP
HRD*:												
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Dekalb----------	0-7	Channery sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	6-20	15-30	50-90	45-80	40-75	20-55	15-32	NP-10
	7-28	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	0	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	28-32	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	0-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	32-42	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HRF*:												
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Dekalb----------	0-4	Cobbly sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	6-20	15-30	50-90	45-80	40-75	20-55	15-32	NP-10
	4-30	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	0	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	30-34	Channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	0-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	34-42	Unweathered bedrock.			0	0	0	0	0	0	---	NP
HwB--------------	0-8	Silt loam------	ML, CL	A-4	0	0-10	80-100	80-95	70-90	55-80	15-30	5-10
Hustontown	8-12	Silt loam, loam	ML, CL	A-4	0	0-15	80-100	80-95	70-90	55-80	15-30	5-10
	12-20	Silt loam, silty clay loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0	0-15	80-100	70-95	60-90	40-85	25-40	3-15
	20-30	Channery silty clay loam, silt loam, channery loam.	ML, CL, SM, SC	A-4, A-6	0	0-15	80-100	65-95	60-90	40-85	25-40	3-15
	30-65	Channery clay loam, channery loam, silt loam.	CL, ML, SC, SC-SM	A-4, A-2, A-6	0	0-15	60-100	40-90	35-85	25-80	20-40	3-15
Jg*:												
Jugtown---------	0-12	Silt loam------	ML, CL-ML, CL	A-4, A-6	0	0	80-100	80-100	70-95	50-90	20-35	2-15
	12-18	Clay loam, silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	70-100	65-100	60-95	50-90	25-40	4-16
	18-26	Clay loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0-1	70-100	65-100	60-95	50-85	25-40	4-18
	26-38	Clay loam, gravelly clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	0-5	70-100	65-100	60-90	50-80	25-40	4-18
	38-65	Sandy clay loam, very gravelly sandy loam, extremely cobbly loam.	ML, SM, GM, GM-GC	A-4, A-1-A, A-2-4	0-1	0-10	35-90	30-85	25-70	20-60	15-30	2-18

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Jg*:												
Lindside	0-13	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-35	2-15
	13-46	Silty clay loam, silt loam, very fine sandy loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	70-95	25-40	4-18
	46-65	Stratified silty clay loam to gravelly sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	0	60-100	55-100	45-100	30-95	20-40	4-18
KaB	0-6	Channery silt loam.	GM, SM, GM-GC	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	15-25	NP-5
Klinesville	6-8	Channery silt loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	8-14	Very channery loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	14-24	Weathered bedrock.			0	0	0	0	0	0	---	NP
KaC	0-6	Channery silt loam.	GM, SM, GM-GC	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	15-25	NP-5
Klinesville	6-8	Channery silt loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	8-14	Very channery loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	14-24	Weathered bedrock.			0	0	0	0	0	0	---	NP
KaD	0-6	Channery silt loam.	GM, SM, GM-GC	A-2, A-4	0	0-10	55-85	45-60	35-50	25-40	15-25	NP-5
Klinesville	6-8	Channery silt loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	8-14	Very channery loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	14-24	Weathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KWF*:												
Klinesville-----	0-3	Very channery silt loam.	GM, SM, GP, GM-GC	A-2, A-4, A-1-A	0	0-10	25-75	15-55	10-50	4-40	15-20	NP-5
	3-8	Channery silt loam, very channery silt loam.	GM, GP, SM, SP	A-2, A-1, A-4	0	0-10	25-75	15-55	10-50	4-40	20-35	NP-9
	8-14	Very channery loam, extremely channery silt loam.	GM, GP, SM, SP	A-2, A-1	0	0-20	15-60	10-50	10-40	4-30	20-35	NP-7
	14-24	Weathered bedrock.			0	0	0	0	0	0	---	NP
Weikert---------	0-3	Very channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0	10-25	35-70	25-70	25-65	20-55	30-40	4-10
	3-18	Very channery loam, very channery silt loam, extremely gravelly loam.	GM, GP-GM	A-1, A-2	0-1	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	18-28	Weathered bedrock.			0	0	0	0	0	0	---	NP
LaB---------- Laidig	0-8	Gravelly loam--	GM, SM, ML, CL	A-4	0	0-5	65-90	50-80	45-80	35-70	15-30	1-10
	8-35	Very gravelly loam, gravelly sandy clay loam, gravelly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	35-65	Gravelly sandy clay loam, very gravelly loam, gravelly sandy loam.	GC, SC, GM-GC, CL-ML	A-2, A-4, A-6	0	5-20	50-90	40-85	30-80	15-70	15-35	2-16
LaC---------- Laidig	0-8	Gravelly loam--	GM, SM, ML, CL	A-4	0	0-5	65-90	50-80	45-80	35-70	15-30	1-10
	8-35	Very gravelly loam, gravelly sandy clay loam, gravelly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	0	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	35-65	Gravelly sandy clay loam, very gravelly loam, gravelly sandy loam.	GC, SC, GM-GC, CL-ML	A-2, A-4, A-6	0	5-20	50-90	40-85	30-80	15-70	15-35	2-16

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LbB---------- Laidig	0-5	Gravelly loam--	GM-GC, CL-ML, SC-SM, SM	A-4	5-20	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	5-36	Very gravelly loam, gravelly sandy clay loam, gravelly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	0-5	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	36-65	Gravelly sandy clay loam, very gravelly loam, gravelly sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	0-5	5-20	50-90	40-85	30-80	15-70	15-35	2-16
LbD---------- Laidig	0-5	Gravelly loam--	GM-GC, CL-ML, SC-SM, SM	A-4	5-20	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	5-36	Very gravelly loam, gravelly sandy clay loam, gravelly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	0-5	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	36-65	Gravelly sandy clay loam, very gravelly loam, gravelly sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	0-5	5-20	50-90	40-85	30-80	15-70	15-35	2-16
LCE*:												
Laidig----------	0-5	Gravelly loam--	GM-GC, CL-ML, SC-SM, SM	A-4	5-20	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	5-36	Very gravelly loam, gravelly sandy clay loam, gravelly sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	0-5	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	36-65	Gravelly sandy clay loam, very gravelly loam, gravelly sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	0-5	5-20	50-90	40-85	30-80	15-70	15-35	2-16
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ln	0-13	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-35	2-15
Lindside	13-46	Silty clay loam, silt loam, very fine sandy loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	70-95	25-40	4-18
	46-65	Stratified silty clay loam to gravelly sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	0	60-100	55-100	45-100	30-95	20-40	4-18
Me	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	90-100	80-100	80-95	25-35	4-10
Melvin	10-36	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	80-95	25-40	5-20
	36-72	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-100	60-95	25-40	5-20
MoB	0-8	Silt loam	ML, SM, CL-ML, SC-SM	A-4	0	0-5	90-100	85-100	75-100	45-90	20-35	1-10
Monongahela	8-30	Silt loam, clay loam, gravelly loam.	CL, CL-ML	A-4, A-6	0	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	30-51	Silt loam, sandy clay loam, gravelly loam.	ML, CL, SM, SC	A-4, A-6	0	0-10	80-100	60-100	55-95	45-95	20-40	3-15
	51-65	Silt loam, clay loam, gravelly sandy loam.	ML, CL, SM, SC	A-4, A-6	0	10-20	75-100	60-90	60-85	40-85	20-40	1-15
MrB	0-9	Gravelly loam	ML, CL, GM, SC-SM	A-4, A-6, A-2	0	0-5	65-80	55-70	45-65	30-65	20-45	3-15
Murrill	9-55	Gravelly clay loam, gravelly silty clay loam, sandy clay loam.	CL, CL-ML	A-4, A-6, A-7	0	0-10	65-85	60-70	55-65	50-65	20-50	5-25
	55-70	Silty clay, very gravelly clay loam, gravelly silty clay loam.	CH, MH, CL	A-6, A-7	0-1	0-10	80-100	50-100	45-100	40-100	35-75	20-40
MrC	0-9	Gravelly loam	ML, CL, GM, SC-SM	A-4, A-6, A-2	0	0-5	65-80	55-70	45-65	30-65	20-45	3-15
Murrill	9-55	Gravelly clay loam, gravelly silty clay loam, sandy clay loam.	CL, CL-ML	A-4, A-6, A-7	0	0-10	65-85	60-70	55-65	50-65	20-50	5-25
	55-70	Silty clay, very gravelly clay loam, gravelly silty clay loam.	CH, MH, CL	A-6, A-7	0-1	0-10	80-100	50-100	45-100	40-100	35-75	20-40

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MvD---------- Murrill	0-10	Gravelly loam--	CL, ML, GM, SC-SM	A-4, A-6, A-2	5-20	10-25	70-90	50-70	45-65	30-65	20-40	3-15
	10-55	Channery silty clay loam, channery sandy clay loam, channery clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	0-15	65-85	60-70	55-65	50-65	25-50	5-25
	55-70	Clay loam, clay, channery clay loam.	CH, CL, MH	A-6, A-7	0-1	0-20	80-100	65-100	60-100	55-100	35-75	20-40
PcB---------- Pecktonville	0-11	Gravelly silt loam.	ML, GM	A-4, A-6	0	0-15	60-80	50-75	40-70	35-65	20-40	3-15
	11-32	Silt loam, silty clay loam, loam.	CL-ML, CL, SC	A-4, A-6	0	0-5	90-100	75-95	45-85	40-80	20-40	5-20
	32-63	Silty clay loam, channery silty clay, clay.	CH, GC, CL, SC	A-6, A-2-6	0	0-5	45-100	40-95	35-90	30-90	35-60	15-40
	63-75	Clay loam, silty clay, clay.	CH, CL	A-6, A-7-6	0	0-5	90-100	85-100	70-100	65-95	35-60	15-40
PcC---------- Pecktonville	0-11	Gravelly silt loam.	ML, GM	A-4, A-6	0	0-15	60-80	50-75	40-70	35-65	20-40	3-15
	11-32	Silt loam, silty clay loam, loam.	CL-ML, CL, SC	A-4, A-6	0	0-5	90-100	75-95	45-85	40-80	20-40	5-20
	32-63	Silty clay loam, channery silty clay, clay.	CH, GC, CL, SC	A-6, A-2-6	0	0-5	45-100	40-95	35-90	30-90	35-60	15-40
	63-75	Clay loam, silty clay, clay.	CH, CL	A-6, A-7-6	0	0-5	90-100	85-100	70-100	65-95	35-60	15-40
PeE*:												
Pecktonville----	0-11	Gravelly silt loam.	GM, GC, ML, CL	A-2, A-4, A-6	0	0-15	45-80	40-75	35-70	30-65	20-35	NP-12
	11-32	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0	0-5	70-100	65-95	55-90	50-85	20-40	5-15
	32-63	Silty clay loam, channery silty clay, clay.	CL, CH	A-6	0	0-5	65-100	60-95	50-90	45-85	30-60	10-40
	63-75	Clay loam, silty clay, clay.	CL, CH	A-6	0	0-5	90-100	80-95	70-90	65-85	30-60	10-40
Rock outcrop----	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pg	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	90-100	70-100	15-40	5-25
Penlaw	10-23	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	90-100	70-100	15-40	5-25
	23-50	Silty clay loam, silt loam, gravelly silt loam.	CL, CH, CL-ML	A-4, A-6, A-7	0	0-5	85-100	75-100	55-100	50-95	15-55	6-30
	50-65	Silty clay, clay, loam.	CL, GC, SC, CH	A-4, A-6, A-7	0	0-20	65-100	60-100	55-100	40-95	15-55	6-30
Ph	0-9	Silt loam	ML, CL-ML	A-4	0	0-5	95-100	80-100	75-90	60-80	20-35	1-10
Philo	9-29	Silt loam, loam, sandy loam.	ML, SM, CL-ML	A-4	0	0-5	95-100	75-100	70-90	45-80	20-35	1-10
	29-65	Stratified sand to silt loam.	GM, SM, ML, CL-ML	A-2, A-4	0-5	0-5	60-95	50-90	40-85	30-80	15-30	1-10
Po	0-10	Silt loam	ML, CL, SM, CL-ML	A-4	0	0	85-100	75-100	70-100	45-90	15-30	NP-10
Pope	10-40	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	95-100	80-100	51-95	25-75	15-30	NP-7
	40-65	Sandy loam, loamy sand.	SM, SC-SM, ML, GM	A-2, A-1, A-4	0	0-20	45-100	35-100	30-95	15-70	15-30	NP-7
Pu	0-7	Silty clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0	95-100	90-100	90-100	90-100	25-50	4-20
Purdy	7-40	Silty clay, clay, clay loam.	CL, CH, MH	A-6, A-7	0	0	95-100	90-100	85-100	75-85	30-65	11-30
	40-65	Silty clay, clay loam, clay.	CL, CH, MH	A-6, A-7	0	0	95-100	90-100	85-100	70-95	30-65	11-30
Q*	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Quarries												
SeB	0-8	Gravelly loam	GM, ML, SM, GC	A-4, A-6	0	0-5	50-85	45-75	40-70	35-65	20-30	3-11
Sideling	8-35	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	35-65	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30
SeC	0-8	Gravelly loam	GM, ML, SM, GC	A-4, A-6	0	0-5	50-85	45-75	40-70	35-65	20-30	3-11
Sideling	8-35	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	35-65	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SeD---------- Sideling	0-8	Gravelly loam--	GM, ML, SM, GC	A-4, A-6	0	0-5	50-85	45-75	40-70	35-65	20-30	3-11
	8-35	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	35-65	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30
SrB---------- Sideling	0-4	Gravelly loam--	GM, ML, SM, GC	A-4, A-6	3-15	0-15	50-85	45-75	40-70	35-65	20-30	3-11
	4-38	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	38-74	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30
SrD---------- Sideling	0-4	Gravelly loam--	GM, ML, SM, GC	A-4, A-6	3-15	0-15	50-85	45-75	40-70	35-65	20-30	3-11
	4-38	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	38-74	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30
SSF*:												
Sideling--------	0-4	Gravelly loam--	GM, ML, SM, GC	A-4, A-6	3-15	0-15	50-85	45-75	40-70	35-65	20-30	3-11
	4-38	Gravelly loam, gravelly clay loam, very gravelly sandy clay loam.	GM, GC, ML, CL	A-4, A-6	0-5	0-15	50-95	45-90	40-85	35-80	20-35	3-15
	38-74	Channery silty clay loam, channery clay loam, clay.	CL, CH	A-6, A-7	0-1	0-15	50-95	45-90	40-85	35-80	30-55	10-30
Hazleton--------	0-10	Channery sandy loam.	GM, SM, ML, SC-SM	A-4	5-20	15-50	60-85	50-80	50-70	35-55	15-25	NP-8
	10-42	Channery sandy loam, channery loam, loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-5	0-50	60-95	45-90	35-70	20-55	15-30	NP-8
	42-65	Channery loam, very channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	2-10	5-60	50-80	35-75	25-65	15-50	15-30	NP-8
	65-75	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ty----------	0-8	Silt loam------	ML	A-4	0	0	100	95-100	90-100	75-95	30-40	4-10
Tyler	8-30	Silty clay loam, silt loam.	CL	A-6, A-7, A-4	0	0	100	95-100	90-100	80-100	25-45	8-20
	30-40	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7, A-4	0	0	90-100	85-100	80-100	65-95	25-45	8-20
	40-65	Stratified gravelly loam to silty clay loam.	CL, ML, CL-ML	A-6, A-4, A-7	0	0	85-100	75-100	75-100	55-90	20-45	4-18
Uu*:												
Urban land------	0-6	Variable-------	---	---	---	---	---	---	---	---	---	---
Udorthents------	0-4	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	0-5	85-100	80-100	75-100	75-95	30-70	15-40
	4-65	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	0-5	85-100	80-100	75-100	75-95	30-70	15-40
WeB----------	0-8	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0	0-10	35-70	35-70	25-65	20-55	30-40	4-10
Weikert	8-18	Extremely channery loam, very channery silt loam, very gravelly loam.	GM, GP-GM	A-1, A-2	0	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	18	Fractured bedrock.			0	0	0	0	0	0	---	NP
WeC----------	0-6	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0	0-10	35-70	35-70	25-65	20-55	30-40	4-10
Weikert	6-18	Extremely channery loam, very channery silt loam, very gravelly loam.	GM, GP-GM	A-1, A-2	0	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	22	Fractured bedrock.			0	0	0	0	0	0	---	NP
WeD----------	0-4	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0	0-10	35-70	35-70	25-65	20-55	30-40	4-10
Weikert	4-18	Extremely channery loam, very channery silt loam, very gravelly loam.	GM, GP-GM	A-1, A-2	0	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	18	Fractured bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WuB*:												
Wurno	0-7	Channery silt loam.	GM, GC, ML, CL	A-2, A-4	0	0-5	60-100	50-95	30-95	20-85	15-30	1-10
	7-11	Silty clay loam, channery silt loam, extremely channery silt loam.	GM, GC, ML, CL	A-1, A-2, A-4, A-6	0	0-5	40-100	10-85	5-80	5-75	15-30	1-15
	11-26	Channery silt loam, extremely channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-5	30-100	10-50	5-50	5-45	15-30	1-10
	26-31	Weathered bedrock.			0	0	0	0	0	0	---	NP
	31-41	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Nollville	0-10	Channery silt loam.	CL-ML, CL, GC	A-4, A-6, A-2	0	0	55-80	50-75	40-75	30-70	20-35	4-12
	10-29	Silty clay loam, silt loam, channery silty clay loam.	CL, GC, SC	A-6	0	0	55-100	50-100	45-100	35-95	25-40	11-23
	29-41	Silty clay, silty clay loam, channery silt loam.	CL, GC, SC	A-6, A-7	0	0	55-100	50-100	45-100	35-95	30-50	11-30
	41-57	Very channery silty clay loam, extremely channery silt loam, channery clay.	GC, CL	A-6, A-7, A-2	0	0-10	25-65	20-60	20-60	15-55	30-50	11-30
	57-67	Unweathered bedrock.			0	0	0	0	0	0	---	NP
WuC*:												
Wurno	0-7	Channery silt loam.	GM, GC, ML, CL	A-2, A-4	0	0-5	60-100	50-95	30-95	20-85	15-30	1-10
	7-11	Silty clay loam, channery silt loam, extremely channery silt loam.	GM, GC, ML, CL	A-1, A-2, A-4, A-6	0	0-5	40-100	10-85	5-80	5-75	15-30	1-15
	11-26	Channery silt loam, extremely channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-5	30-100	10-50	5-50	5-45	15-30	1-10
	26-31	Weathered bedrock.			0	0	0	0	0	0	---	NP
	31-41	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WuC*:												
Nollville-------	0-10	Channery silt loam.	CL-ML, CL, GC	A-4, A-6, A-2	0	0	55-80	50-75	40-75	30-70	20-35	4-12
	10-29	Silty clay loam, silt loam, channery silty clay loam.	CL, GC, SC	A-6	0	0	55-100	50-100	45-100	35-95	25-40	11-23
	29-41	Silty clay, silty clay loam, channery silt loam.	CL, GC, SC	A-6, A-7	0	0	55-100	50-100	45-100	35-95	30-50	11-30
	41-57	Very channery silty clay loam, extremely channery silt loam, channery clay.	GC, CL	A-6, A-7, A-2	0	0-10	25-65	20-60	20-60	15-55	30-50	11-30
	57-67	Unweathered bedrock.			0	0	0	0	0	0	---	NP
WuD*:												
Wurno----------	0-4	Channery silt loam.	GM, GC, ML, CL	A-2, A-4	0	0-5	60-100	50-95	30-95	20-85	15-30	1-10
	4-11	Silty clay loam, channery silt loam, extremely channery silt loam.	GM, GC, ML, CL	A-1, A-2, A-4, A-6	0	0-5	40-100	10-85	5-80	5-75	15-30	1-15
	11-26	Channery silt loam, extremely channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-5	30-100	10-50	5-50	5-45	15-30	1-10
	26-31	Weathered bedrock.			0	0	0	0	0	0	---	NP
	31-41	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Nollville-------	0-8	Channery silt loam.	CL-ML, CL, GC	A-4, A-6, A-2	0	0	55-80	50-75	40-75	30-70	20-35	4-12
	8-27	Silty clay loam, silt loam, channery silty clay loam.	CL, GC, SC	A-6	0	0	55-100	50-100	45-100	35-95	25-40	11-23
	27-39	Silty clay, silty clay loam, channery silt loam.	CL, GC, SC	A-6, A-7	0	0	55-100	50-100	45-100	35-95	30-50	11-30
	39-55	Very channery silty clay loam, extremely channery silt loam, channery clay.	GC, CL	A-6, A-7, A-2	0	0-10	25-65	20-60	20-60	15-55	30-50	11-30
	55-65	Unweathered bedrock.			0	0	0	0	0	0	---	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WuE*:												
Wurno----------	0-4	Channery silt loam.	GM, GC, ML, CL	A-2, A-4	0	0-5	60-100	50-95	30-95	20-85	15-30	1-10
	4-11	Silty clay loam, channery silt loam, extremely channery silt loam.	GM, GC, ML, CL	A-1, A-2, A-4, A-6	0	0-5	40-100	10-85	5-80	5-75	15-30	1-15
	11-25	Channery silt loam, extremely channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0	0-5	30-100	10-50	5-50	5-45	15-30	1-10
	25-31	Weathered bedrock.			0	0	0	0	0	0	---	NP
	31-36	Unweathered bedrock.			0	0	0	0	0	0	---	NP
Nollville-------	0-6	Channery silt loam.	CL-ML, CL, GC	A-4, A-6, A-2	0	0	55-80	50-75	40-75	30-70	20-35	4-12
	6-26	Silty clay loam, silt loam, channery silty clay loam.	CL, GC, SC	A-6	0	0	55-100	50-100	45-100	35-95	25-40	11-23
	26-38	Silty clay, silty clay loam, channery silt loam.	CL, GC, SC	A-6, A-7	0	0	55-100	50-100	45-100	35-95	30-50	11-30
	38-54	Very channery silty clay loam, extremely channery silt loam, channery clay.	GC, CL	A-6, A-7, A-2	0	0-10	25-65	20-60	20-60	15-55	30-50	11-30
	54-64	Unweathered bedrock.			0	0	0	0	0	0	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
AgB	0-8	15-27	1.20-1.40	0.60-2.00	0.12-0.22	Low	1.0-4.0	0.32	0.32	5	10.0-20.0	3.6-5.5
Allegheny	8-42	18-35	1.20-1.50	0.60-2.00	0.13-0.18	Low	0.0-0.5	0.28	0.28		10.0-20.0	3.6-5.5
	42-65	10-35	1.20-1.40	0.60-2.00	0.08-0.17	Low	0.0-0.5	0.28	0.28		10.0-20.0	3.6-5.5
AnB	0-8	10-27	1.20-1.40	0.60-2.00	0.08-0.18	Low	1.0-4.0	0.24	0.28	3	10.0-26.0	4.5-5.5
Andover	8-19	18-35	1.20-1.40	0.60-2.00	0.08-0.12	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
	19-46	18-35	1.30-1.60	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
	46-65	18-40	1.40-1.70	0.06-0.60	0.08-0.12	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
AoB	0-4	10-27	1.20-1.40	0.60-2.00	0.08-0.20	Low	1.0-4.0	0.17	0.28	3	10.0-26.0	4.5-5.5
Andover	4-19	18-35	1.20-1.40	0.60-2.00	0.08-0.12	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
	19-46	18-35	1.30-1.60	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
	46-65	18-40	1.40-1.70	0.06-0.60	0.08-0.12	Low	0.0-0.5	0.17	0.20		6.0-18.0	4.5-5.5
As	0-4	18-27	1.20-1.40	0.60-2.00	0.14-0.22	Low	2.0-4.0	0.32	0.32	4	15.0-26.0	4.5-5.5
Atkins	4-36	18-35	1.20-1.50	0.06-2.00	0.14-0.18	Low	0.2-0.5	0.32	0.37		6.0-20.0	4.5-5.5
	36-70	10-35	1.20-1.50	0.20-6.00	0.08-0.18	Low	0.2-0.5	0.28	0.43		4.0-20.0	4.5-5.5
Be	0-6	6-18	1.15-1.40	0.60-2.00	0.16-0.21	Low	1.0-5.0	0.32	0.32	3	10.0-25.0	4.5-6.0
Barbour	6-35	6-18	1.15-1.45	2.00-6.00	0.10-0.19	Low	0.0-2.0	0.32	0.37		6.0-20.0	4.5-6.0
	35-65	1-8	1.25-1.55	6.00-20.00	0.02-0.07	Low	0.0-0.6	0.17	0.20		4.0-10.0	4.5-6.5
Bf	0-8	6-18	1.15-1.40	0.60-2.00	0.15-0.21	Low	1.0-5.0	0.32	0.32	5	10.0-25.0	3.5-6.0
Basher	8-22	6-18	1.15-1.45	0.60-2.00	0.10-0.19	Low	0.0-3.0	0.32	0.32		4.0-20.0	3.6-6.0
	22-46	6-18	1.25-1.55	0.20-2.00	0.10-0.19	Low	0.0-0.8	0.32	0.32		4.0-20.0	4.5-6.5
	46-65	1-8	1.25-1.55	0.60-6.00	0.02-0.07	Low	0.0-0.5	0.17	0.20		2.0-12.0	4.5-6.5
BhB	0-10	15-25	1.20-1.50	0.60-6.00	0.12-0.16	Low	1.0-3.0	0.28	0.32	5	10.0-20.0	5.1-7.3
Bedington	10-43	18-32	1.30-1.60	0.60-6.00	0.12-0.14	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
	43-65	18-32	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
BhC	0-8	15-25	1.20-1.50	0.60-6.00	0.12-0.16	Low	1.0-3.0	0.28	0.32	5	10.0-20.0	5.1-7.3
Bedington	8-52	18-32	1.30-1.60	0.60-6.00	0.12-0.14	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
	52-65	18-32	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
BhD	0-6	15-25	1.20-1.50	0.60-6.00	0.12-0.16	Low	1.0-3.0	0.28	0.32	5	10.0-20.0	5.1-7.3
Bedington	6-52	18-32	1.30-1.60	0.60-6.00	0.12-0.14	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
	52-65	18-32	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.20	0.28		10.0-15.0	4.5-5.5
BkB	0-8	5-23	1.20-1.50	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.20	0.28	3	5.0-15.0	3.6-6.5
Berks	8-26	5-32	1.20-1.60	0.60-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-10.0	3.6-6.5
	26-36	5-20	1.20-1.60	2.00-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-15.0	3.6-6.5
	36-46	---	---	0.20-2.00	---	---	---	0.20	---		---	---
BkC	0-8	5-23	1.20-1.50	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.20	0.28	3	5.0-15.0	3.6-6.5
Berks	8-26	5-32	1.20-1.60	0.60-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-10.0	3.6-6.5
	26-36	5-20	1.20-1.60	2.00-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-15.0	3.6-6.5
	36-46	---	---	0.20-2.00	---	---	---	0.20	---		---	---
BkD	0-6	5-23	1.20-1.50	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.20	0.28	3	5.0-15.0	3.6-6.5
Berks	6-26	5-32	1.20-1.60	0.60-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-10.0	3.6-6.5
	26-36	5-20	1.20-1.60	2.00-6.00	0.04-0.10	Low	0.0-0.5	0.20	0.24		5.0-15.0	3.6-6.5
	36-46	---	---	0.20-2.00	---	---	---	0.20	---		---	---

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
BrA	0-9	15-27	1.20-1.40	0.60-2.00	0.18-0.24	Low	1.0-4.0	0.32	0.32	4	18.0-26.0	4.5-6.0
Brinkerton	9-18	18-35	1.20-1.50	0.60-2.00	0.14-0.18	Moderate	0.0-0.5	0.37	0.37		14.0-24.0	4.5-6.0
	18-46	15-35	1.60-1.80	0.06-0.20	0.08-0.12	Moderate	0.0-0.5	0.32	0.37		14.0-24.0	4.5-6.0
	46-65	15-25	1.40-1.55	0.06-0.60	0.14-0.18	Low	0.0-0.5	0.20	0.28		12.0-22.0	5.1-6.5
BrB	0-9	15-27	1.20-1.40	0.60-2.00	0.18-0.24	Low	1.0-4.0	0.32	0.32	4	18.0-26.0	4.5-6.0
Brinkerton	9-18	18-35	1.20-1.50	0.60-2.00	0.14-0.18	Moderate	0.0-0.5	0.37	0.37		14.0-24.0	4.5-6.0
	18-46	15-35	1.60-1.80	0.06-0.20	0.08-0.12	Moderate	0.0-0.5	0.32	0.37		14.0-24.0	4.5-6.0
	46-65	15-25	1.40-1.55	0.06-0.60	0.14-0.18	Low	0.0-0.5	0.20	0.28		12.0-22.0	5.1-6.5
BuB	0-8	10-27	1.20-1.40	0.60-2.00	0.12-0.18	Low	1.0-3.0	0.24	0.32	4	10.0-24.0	3.5-5.5
Buchanan	8-32	18-30	1.30-1.60	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.24	0.28		6.0-18.0	3.5-5.5
	32-65	18-35	1.40-1.70	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.24		6.0-18.0	3.5-5.5
BuC	0-6	10-27	1.20-1.40	0.60-2.00	0.12-0.18	Low	1.0-3.0	0.24	0.32	4	10.0-24.0	3.5-5.5
Buchanan	6-21	18-30	1.30-1.60	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.24	0.28		6.0-18.0	3.5-5.5
	21-65	18-35	1.40-1.70	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.24		6.0-18.0	3.5-5.5
BxB	0-4	10-27	1.20-1.40	0.60-2.00	0.11-0.16	Low	1.0-4.0	0.24	0.32	4	10.0-24.0	3.5-5.5
Buchanan	4-30	18-30	1.30-1.60	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.24	0.28		6.0-18.0	3.5-5.5
	30-65	18-35	1.40-1.70	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.24		6.0-18.0	3.5-5.5
BxD	0-4	10-27	1.20-1.40	0.60-2.00	0.11-0.16	Low	1.0-4.0	0.24	0.32	4	10.0-24.0	3.5-5.5
Buchanan	4-30	18-30	1.30-1.60	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.24	0.28		6.0-18.0	3.5-5.5
	30-65	18-35	1.40-1.70	0.06-0.20	0.06-0.10	Low	0.0-0.5	0.17	0.24		6.0-18.0	3.5-5.5
CaB	0-8	10-25	1.20-1.40	2.00-6.00	0.10-0.16	Low	1.0-3.0	0.20	0.24	3	12.0-22.0	5.1-6.5
Calvin	8-30	10-25	1.40-1.60	2.00-6.00	0.08-0.16	Low	0.0-0.5	0.20	0.24		7.0-15.0	5.1-6.5
	30-35	10-25	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.0-0.5	0.20	0.28		7.0-15.0	5.1-6.5
	35-45	---	---	0.20-6.00	---	---	---	---	---		---	---
CaC	0-8	10-25	1.20-1.40	2.00-6.00	0.10-0.16	Low	1.0-3.0	0.20	0.24	3	12.0-22.0	5.1-6.5
Calvin	8-30	10-25	1.40-1.60	2.00-6.00	0.08-0.16	Low	0.0-0.5	0.20	0.24		7.0-15.0	5.1-6.5
	30-35	10-25	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.0-0.5	0.20	0.28		7.0-15.0	5.1-6.5
	35-45	---	---	0.20-6.00	---	---	---	---	---		---	---
CaD	0-6	10-25	1.20-1.40	2.00-6.00	0.10-0.16	Low	1.0-3.0	0.20	0.24	3	12.0-22.0	5.1-6.5
Calvin	6-30	10-25	1.40-1.60	2.00-6.00	0.08-0.16	Low	0.0-0.5	0.20	0.24		7.0-15.0	5.1-6.5
	30-35	10-25	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.0-0.5	0.20	0.28		7.0-15.0	5.1-6.5
	35-45	---	---	0.20-6.00	---	---	---	---	---		---	---
CkB*:												
Calvin	0-8	10-25	1.20-1.40	2.00-6.00	0.10-0.16	Low	1.0-3.0	0.20	0.24	3	12.0-22.0	5.1-6.5
	8-30	10-25	1.40-1.60	2.00-6.00	0.08-0.16	Low	0.0-0.5	0.20	0.24		7.0-15.0	5.1-6.5
	30-35	10-25	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.0-0.5	0.20	0.28		7.0-15.0	5.1-6.5
	35-45	---	---	0.20-6.00	---	---	---	---	---		---	---
Leck Kill	0-9	10-20	1.20-1.50	0.60-6.00	0.14-0.18	Low	1.0-3.0	0.24	0.32	4	10.0-20.0	5.1-7.3
	9-45	18-32	1.40-1.70	0.60-6.00	0.12-0.16	Low	0.0-0.5	0.24	0.28		7.0-15.0	4.5-7.3
	45-60	17-32	1.30-1.60	0.60-6.00	0.04-0.08	Low	0.0-0.5	0.17	0.28		7.0-15.0	4.5-6.0
	60-70	---	---	0.20-6.00	---	---	---	---	---		---	---
CoC	0-8	27-40	1.20-1.40	0.60-2.00	0.16-0.19	Moderate	0.5-3.0	0.37	0.37	2	15.0-30.0	6.1-7.3
Carbo	8-37	60-80	1.30-1.45	0.06-0.20	0.10-0.14	High	0.0-0.5	0.24	0.24		20.0-35.0	5.6-7.8
	37-47	---	---	2.00-20.00	---	---	---	---	---		---	---
CoD	0-7	20-40	1.20-1.40	0.60-2.00	0.16-0.19	Moderate	0.5-3.0	0.37	0.37	2	15.0-30.0	6.1-7.3
Carbo	7-37	60-80	1.30-1.45	0.06-0.20	0.10-0.14	High	0.0-0.5	0.24	0.24		20.0-35.0	5.6-7.8
	37-47	---	---	2.00-20.00	---	---	---	---	---		---	---

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
CrC	0-3	18-27	1.35-1.65	0.60-6.00	0.07-0.16	Low	0.0-0.5	0.32	0.43	5	15.0-30.0	3.6-5.5
Cedarcreek	3-60	18-27	1.35-1.65	0.60-6.00	0.07-0.16	Low	---	0.32	0.43		15.0-30.0	3.6-5.5
CrF	0-3	18-27	1.35-1.65	0.60-6.00	0.07-0.16	Low	0.0-0.5	0.32	0.43	5	15.0-30.0	3.6-5.5
Cedarcreek	3-60	18-27	1.35-1.65	0.60-6.00	0.07-0.16	Low	---	0.32	0.43		15.0-30.0	3.6-5.5
CsB	0-10	10-27	1.20-1.40	0.60-2.00	0.14-0.20	Low	1.0-3.0	0.37	0.37	4	12.0-20.0	5.1-6.5
Cedarcreek	10-32	22-35	1.30-1.50	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		12.0-25.0	5.1-6.5
	32-48	22-35	1.40-1.70	0.06-0.60	0.06-0.12	Moderate	0.0-0.5	0.28	0.32		12.0-25.0	5.1-6.5
	48-65	22-40	1.20-1.60	0.06-0.60	0.06-0.16	Moderate	0.0-0.5	0.28	0.32		15.0-28.0	5.1-6.5
DEF*:												
Dekalb	0-7	10-20	1.20-1.50	2.00-20.00	0.08-0.12	Low	2.0-4.0	0.17	0.20	2	3.5-5.5	3.5-5.5
	7-28	10-20	1.20-1.50	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.17	0.24		3.5-5.5	3.5-5.5
	28-32	7-18	1.20-1.50	6.00-20.00	0.05-0.10	Low	0.0-0.5	0.17	0.24		3.5-5.5	3.5-5.5
	32-42	---	1.20-1.50	2.00-6.00	---	---	---	---	---		---	---
Hazleton	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	3.5-5.5	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		3.5-5.5	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.5-5.5	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
EgB	0-8	5-15	1.20-1.40	2.00-6.00	0.07-0.12	Low	1.0-3.0	0.20	0.32	5	8.0-20.0	5.1-7.3
Elliber	8-65	12-30	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.17	0.24		7.0-18.0	3.5-5.5
EgC	0-8	5-15	1.20-1.40	2.00-6.00	0.07-0.12	Low	1.0-3.0	0.20	0.32	5	8.0-20.0	5.1-7.3
Elliber	8-65	12-30	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.17	0.24		7.0-18.0	3.5-5.5
EgD	0-10	5-15	1.20-1.40	2.00-6.00	0.07-0.12	Low	1.0-3.0	0.20	0.32	5	8.0-20.0	5.1-7.3
Elliber	10-65	12-30	1.40-1.60	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.17	0.24		7.0-18.0	3.5-5.5
ErB	0-7	15-20	1.20-1.40	0.60-2.00	0.14-0.20	Low	2.0-4.0	0.43	0.43	4	18.0-25.0	4.5-6.0
Ernest	7-27	20-35	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.32	0.32		14.0-25.0	4.5-5.0
	27-43	18-30	1.40-1.70	0.06-0.60	0.08-0.12	Low	0.0-0.5	0.32	0.37		12.0-22.0	4.5-5.5
	43-65	20-35	1.30-1.60	0.06-0.60	0.08-0.12	Moderate	0.0-0.5	0.32	0.37		12.0-22.0	4.5-5.5
FrB	0-9	18-27	1.20-1.40	0.60-2.00	0.16-0.20	Low	1.0-4.0	0.28	0.37	3	15.0-20.0	5.1-6.5
Frankstown	9-16	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.28		12.0-20.0	4.5-6.0
	16-37	25-40	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		12.0-20.0	4.5-6.0
	37-65	25.45	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		10.0-15.0	4.5-6.0
FrC	0-9	18-27	1.20-1.40	0.60-2.00	0.16-0.20	Low	1.0-4.0	0.28	0.37	3	15.0-20.0	5.1-6.5
Frankstown	9-16	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.28		12.0-20.0	4.5-6.0
	16-37	25-40	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		12.0-20.0	4.5-6.0
	37-65	25.45	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		10.0-15.0	4.5-6.0
FrD	0-7	18-27	1.20-1.40	0.60-2.00	0.16-0.20	Low	1.0-4.0	0.28	0.37	3	15.0-20.0	5.1-6.5
Frankstown	7-16	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.28		12.0-20.0	4.5-6.0
	16-37	25-40	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		12.0-20.0	4.5-6.0
	37-65	25.45	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		10.0-15.0	4.5-6.0
FrE	0-3	18-27	1.20-1.40	0.60-2.00	0.16-0.20	Low	1.0-4.0	0.28	0.37	3	15.0-20.0	5.1-6.5
Frankstown	3-16	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.28		12.0-20.0	4.5-6.0
	16-37	25-40	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		12.0-20.0	4.6-6.0
	37-65	25.45	1.30-1.50	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.32		10.0-15.0	4.5-6.0
Fu	0-15	15-25	1.10-1.30	0.60-2.00	0.17-0.20	Low	1.0-5.0	0.32	0.43	5	8.0-15.0	6.6-7.3
Funkstown	15-24	20-30	1.30-1.50	0.60-2.00	0.14-0.17	Low	0.0-0.5	0.24	0.32		5.0-10.0	6.1-7.3
	24-52	25-40	1.30-1.50	0.60-2.00	0.08-0.14	Low	0.0-0.5	0.28	0.32		5.0-10.0	6.1-7.3
	52-74	25-40	1.30-1.50	0.60-2.00	0.17-0.20	Low	0.0-0.5	0.20	0.32		5.0-10.0	6.1-7.3

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HaB----------	0-10	15-27	1.20-1.40	0.60-6.00	0.16-0.24	Low	1.0-5.0	0.32	0.32	5	15.0-30.0	5.1-7.3
Hagerstwon	10-17	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-30.0	4.5-7.3
	17-71	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-35.0	5.1-7.3
HaC----------	0-7	15-27	1.20-1.40	0.60-6.00	0.16-0.24	Low	1.0-5.0	0.32	0.32	5	15.0-30.0	5.1-7.3
Hagerstown	7-14	25-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-30.0	4.5-7.3
	14-68	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-35.0	5.1-7.3
HbB*:												
Hagerstown------	0-8	27-35	1.20-1.40	0.60-6.00	0.16-0.24	Low	1.0-5.0	0.32	0.32	5	15.0-30.0	5.1-7.3
	8-21	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-30.0	4.5-7.3
	21-65	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-35.0	5.1-7.3
Carbo----------	0-10	27-40	1.20-1.40	0.60-2.00	0.16-0.19	Moderate	0.5-3.0	0.37	0.37	2	15.0-30.0	6.1-7.3
	10-37	60-80	1.30-1.45	0.06-0.20	0.10-0.14	High	0.0-0.5	0.24	0.24		20.0-35.0	5.6-7.8
	37-47	---	---	2.00-20.00	---	---	---	---	---		---	---
HkE*:												
Hagerstown------	0-5	27-35	1.20-1.40	0.60-6.00	0.16-0.24	Low	1.0-5.0	0.32	0.32	5	15.0-30.0	4.5-6.5
	5-9	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-30.0	4.5-7.3
	9-65	35-60	1.20-1.60	0.60-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.28		15.0-35.0	5.1-7.3
Rock outcrop----	0-60	---	---	0.06-6.00	---	---	---	---	---	---	---	---
HOD*:												
Hazleton--------	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Clymer----------	0-10	15-27	1.20-1.40	0.60-2.00	0.10-0.16	Low	2.0-4.0	0.17	0.24	3	8.0-20.0	3.5-5.5
	10-39	18-30	1.20-1.50	0.60-2.00	0.08-0.14	Low	0.0-0.5	0.15	0.17		6.0-14.0	3.5-5.5
	39-56	15-27	1.20-1.40	0.60-2.00	0.04-0.08	Low	0.0-0.5	0.15	0.20		6.0-14.0	3.5-5.5
	56-66	---	---	2.00-6.00	---	---	---	---	---		---	---
HRB*:												
Hazleton--------	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Dekalb----------	0-7	10-20	1.20-1.50	6.00-20.00	0.08-0.12	Low	2.0-5.0	0.17	0.24	2	10.0-18.0	3.5-4.4
	7-28	7-18	1.20-1.50	6.00-20.00	0.06-0.12	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	28-32	5-15	1.20-1.50	6.00-20.00	0.05-0.10	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	32-42	---	---	2.00-6.00	---	---	---	---	---		---	---
HRD*:												
Hazleton--------	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Dekalb----------	0-7	10-20	1.20-1.50	6.00-20.00	0.08-0.12	Low	2.0-5.0	0.17	0.24	2	10.0-18.0	3.5-4.4
	7-28	7-18	1.20-1.50	6.00-20.00	0.06-0.12	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	28-32	5-15	1.20-1.50	6.00-20.00	0.05-0.10	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	32-42	---	---	2.00-6.00	---	---	---	---	---		---	---

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HRF*:												
Hazleton	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Dekalb	0-4	10-20	1.20-1.50	6.00-20.00	0.08-0.12	Low	2.0-5.0	0.17	0.24	2	10.0-18.0	3.5-4.4
	4-30	7-18	1.20-1.50	6.00-20.00	0.06-0.12	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	30-34	5-15	1.20-1.50	6.00-20.00	0.05-0.10	Low	0.0-0.5	0.17	0.24		5.0-10.0	3.5-5.5
	34-42	---	---	2.00-6.00	---	---	---	---	---		---	---
HwB	0-8	15-27	1.20-1.40	0.60-2.00	0.16-0.20	Low	1.0-4.0	0.32	0.37	4	15.0-45.0	5.1-6.5
Hustontown	8-12	15-27	1.30-1.50	0.60-2.00	0.14-0.20	Low	0.0-0.5	0.28	0.32		15.0-40.0	3.5-6.0
	12-20	18-35	1.30-1.50	0.60-2.00	0.12-0.16	Low	0.0-0.5	0.28	0.32		15.0-30.0	3.5-6.0
	20-30	18-35	1.30-1.50	0.60-2.00	0.12-0.16	Low	0.0-0.5	0.28	0.32		15.0-30.0	3.5-6.0
	30-65	18-30	1.40-1.70	0.20-0.60	0.04-0.08	Low	0.0-0.5	0.28	0.32		15.0-25.0	4.5-6.5
Jg*:												
Jugtown	0-12	8-27	1.20-1.40	0.60-2.00	0.20-0.28	Low	2.0-4.0	0.32	0.32	4	24.0-35.0	6.1-7.3
	12-18	8-32	1.20-1.40	0.60-2.00	0.17-0.22	Low	0.0-0.5	0.37	0.37		20.0-30.0	6.1-7.3
	18-26	18-38	1.20-1.40	0.20-2.00	0.20-0.28	Low	0.0-0.5	0.32	0.32		15.0-30.0	6.1-7.3
	26-38	18-38	1.20-1.40	0.20-2.00	0.20-0.28	Low	0.0-0.5	0.32	0.32		15.0-30.0	6.1-7.3
	38-65	10-30	1.20-1.60	0.60-6.00	0.14-0.20	Low	0.0-0.5	0.20	0.28		8.0-22.0	6.1-7.3
Lindside	0-18	15-27	1.20-1.40	0.60-2.00	0.20-0.26	Low	2.0-4.0	0.32	0.32	5	15.0-30.0	6.1-7.8
	18-48	18-35	1.20-1.40	0.20-2.00	0.17-0.22	Low	0.0-0.5	0.37	0.37		15.0-25.0	5.1-7.8
	48-65	18-35	1.20-1.40	0.20-6.00	0.12-0.18	Low	0.0-0.5	0.32	0.32		8.0-25.0	5.6-7.8
KaB	0-6	10-25	1.20-1.40	2.00-6.00	0.08-0.12	Low	0.5-2.0	0.20	0.28	2	10.0-22.0	4.5-6.0
Klinesville	6-8	10-20	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.2-0.5	0.20	0.28		4.0-12.0	4.5-6.0
	8-14	10-20	1.40-1.60	2.00-6.00	0.04-0.08	Low	0.0-0.2	0.20	0.28		4.0-12.0	4.5-6.0
	14-24	---	---	0.20-2.00	---	---	---	---	---		---	---
KaC	0-6	10-25	1.20-1.40	2.00-6.00	0.08-0.12	Low	0.5-2.0	0.20	0.28	2	10.0-22.0	4.5-6.0
Klinesville	6-8	10-20	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.2-0.5	0.20	0.28		4.0-12.0	4.5-6.0
	8-14	10-20	1.40-1.60	2.00-6.00	0.04-0.08	Low	0.0-0.2	0.20	0.28		4.0-12.0	4.5-6.0
	14-24	---	---	0.20-2.00	---	---	---	---	---		---	---
KaD	0-6	10-25	1.20-1.40	2.00-6.00	0.08-0.12	Low	0.5-2.0	0.20	0.28	2	10.0-22.0	4.5-6.0
Klinesville	6-8	10-20	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.2-0.5	0.20	0.28		4.0-12.0	4.5-6.0
	8-14	10-20	1.40-1.60	2.00-6.00	0.04-0.08	Low	0.0-0.2	0.20	0.28		4.0-12.0	4.5-6.0
	14-24	---	---	0.20-2.00	---	---	---	---	---		---	---
KWF*:												
Klinesville	0-3	10-25	1.20-1.40	2.00-6.00	0.06-0.10	Low	0.5-2.0	0.20	0.28	2	10.0-22.0	4.5-6.0
	3-8	10-20	1.40-1.60	2.00-6.00	0.06-0.10	Low	0.2-0.5	0.20	0.28		4.0-12.0	4.5-6.0
	8-14	10-20	1.40-1.60	2.00-6.00	0.04-0.08	Low	0.0-0.2	0.20	0.28		4.0-12.0	4.5-6.0
	14-24	---	---	0.20-2.00	---	---	---	---	---		---	---
Weikert	0-3	15-27	1.20-1.40	2.00-6.00	0.06-0.12	Low	1.0-4.0	0.17	0.28	2	6.0-20.0	4.5-6.0
	3-18	15-27	1.20-1.40	2.00-6.00	0.04-0.08	Low	0.0-0.5	0.20	0.32		6.0-15.0	4.5-6.0
	18-28	---	---	0.60-20.00	---	---	---	---	---		---	---
LaB	0-8	10-27	1.20-1.40	0.60-6.00	0.10-0.14	Low	1.0-4.0	0.28	0.49	4	8.0-20.0	3.5-5.5
Laidig	8-35	18-35	1.30-1.50	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.24	0.49		7.0-15.0	3.5-5.5
	35-65	18-35	1.30-1.60	0.06-0.60	0.06-0.10	Low	0.0-0.5	0.17	0.37		5.0-15.0	3.5-5.5
LaC	0-8	10-27	1.20-1.40	0.60-6.00	0.10-0.14	Low	1.0-4.0	0.28	0.49	4	8.0-20.0	3.5-5.5
Laidig	8-35	18-35	1.30-1.50	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.24	0.49		7.0-15.0	3.5-5.5
	35-65	18-35	1.30-1.60	0.06-0.60	0.06-0.10	Low	0.0-0.5	0.17	0.37		5.0-15.0	3.5-5.5

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
LbB	0-5	7-27	1.20-1.40	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.24	0.32	4	8.0-20.0	3.6-5.5
Laidig	5-36	18-35	1.30-1.50	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.24	0.28		7.0-15.0	3.6-5.5
	36-65	18-35	1.30-1.60	0.06-0.60	0.06-0.10	Low	0.0-0.5	0.17	0.20		5.0-15.0	3.6-5.5
LbD	0-5	7-27	1.20-1.40	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.24	0.32	4	8.0-20.0	3.6-5.5
Laidig	5-36	18-35	1.30-1.50	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.24	0.28		7.0-15.0	3.6-5.5
	36-65	18-35	1.30-1.60	0.06-0.60	0.06-0.10	Low	0.0-0.5	0.17	0.20		5.0-15.0	3.6-5.5
LCE*:												
Laidig	0-5	7-27	1.20-1.40	0.60-6.00	0.08-0.12	Low	2.0-4.0	0.24	0.32	4	8.0-20.0	3.6-5.5
	5-36	18-35	1.30-1.50	0.60-6.00	0.08-0.12	Low	0.0-0.5	0.24	0.28		7.0-15.0	3.6-5.5
	36-65	18-35	1.30-1.60	0.06-0.60	0.06-0.10	Low	0.0-0.5	0.17	0.20		5.0-15.0	3.6-5.5
Hazleton	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Ln	0-13	15-27	1.20-1.40	0.60-2.00	0.20-0.26	Low	2.0-4.0	0.32	0.32	5	15.0-30.0	6.1-7.8
Lindside	13-46	18-35	1.20-1.40	0.20-2.00	0.17-0.22	Low	0.0-0.5	0.37	0.37		15.0-25.0	5.1-7.8
	46-65	18-35	1.20-1.40	0.20-6.00	0.12-0.18	Low	0.0-0.5	0.32	0.32		8.0-25.0	5.6-7.8
Me	0-10	12-17	1.20-1.60	0.60-2.00	0.18-0.23	Low	0.5-3.0	0.43	0.43	5	20.1-23.0	5.6-7.8
Melvin	10-36	18-35	1.30-1.60	0.60-2.00	0.18-0.23	Low	0.3-0.8	0.43	0.43		18.3-22.2	5.6-7.8
	36-72	7-35	1.40-1.70	0.60-2.00	0.16-0.23	Low	0.1-0.5	0.43	0.43		15.8-19.4	5.6-7.8
MoB	0-8	10-27	1.20-1.40	0.60-2.00	0.18-0.24	Low	2.0-4.0	0.43	0.43	3	5.0-20.0	5.6-7.3
Monongahela	8-30	18-35	1.30-1.50	0.60-2.00	0.14-0.18	Low	0.0-0.5	0.43	0.43		5.0-15.0	4.5-5.5
	30-51	18-35	1.30-1.60	0.06-0.60	0.08-0.12	Low	0.0-0.5	0.43	0.49		0.0-0.5	4.5-5.5
	51-65	10-35	1.20-1.40	0.20-0.60	0.08-0.12	Low	0.0-0.5	0.37	0.43		5.0-15.0	4.5-5.5
MrB	0-9	15-25	1.20-1.50	0.60-2.00	0.12-0.16	Low	1.0-4.0	0.28	0.37	5	10.0-20.0	5.1-7.3
Murrill	9-55	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.24	0.28		8.0-20.0	4.5-6.0
	55-70	27-55	1.40-1.70	0.60-2.00	0.08-0.12	Moderate	0.0-0.5	0.28	0.32		10.0-22.0	4.5-6.0
MrC	0-9	15-25	1.20-1.50	0.60-2.00	0.12-0.16	Low	1.0-4.0	0.28	0.37	5	10.0-20.0	5.1-7.3
Murrill	9-55	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.24	0.28		8.0-20.0	4.5-6.0
	55-70	27-55	1.40-1.70	0.60-2.00	0.08-0.12	Moderate	0.0-0.5	0.28	0.32		10.0-22.0	4.5-6.0
MvD	0-10	10-20	1.20-1.50	0.60-2.00	0.12-0.16	Low	2.0-4.0	0.24	0.32	5	10.0-20.0	4.5-6.0
Murrill	10-55	18-35	1.40-1.70	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.24	0.28		10.0-20.0	4.5-6.0
	55-70	27-55	1.40-1.70	0.20-2.00	0.08-0.12	Moderate	0.0-0.5	0.28	0.32		10.0-20.0	4.5-6.0
PcB	0-11	13-27	1.30-1.50	2.00-6.00	0.12-0.16	Low	2.0-4.0	0.28	0.43	5	10.0-20.0	4.5-6.0
Pecktonville	11-63	27-55	1.20-1.60	0.06-0.60	0.12-0.18	High	0.0-0.5	0.24	0.37		10.0-25.0	4.5-6.0
	63-75	27-55	1.20-1.60	0.06-0.60	0.14-0.20	High	0.0-0.5	0.24	0.37		20.0-35.0	4.5-6.0
PcC	0-11	13-27	1.30-1.50	2.00-6.00	0.12-0.16	Low	2.0-4.0	0.28	0.43	5	10.0-20.0	4.5-6.0
Pecktonville	11-63	27-55	1.20-1.60	0.06-0.60	0.12-0.18	High	0.0-0.5	0.24	0.37		10.0-25.0	4.5-6.0
	63-75	27-55	1.20-1.60	0.06-0.60	0.14-0.20	High	0.0-0.5	0.24	0.37		20.0-35.0	4.5-6.0
PeE*:												
Pecktonville	0-11	13-27	1.30-1.50	2.00-6.00	0.12-0.16	Low	2.0-4.0	0.28	0.43	4	10.0-20.0	4.5-6.0
	11-63	27-55	1.20-1.60	0.06-0.60	0.12-0.18	High	0.0-0.5	0.24	0.37		20.0-35.0	4.5-6.0
	63-75	27-55	1.20-1.60	0.60-2.00	0.14-0.18	High	0.0-0.5	0.24	0.37		20.0-35.0	4.5-6.0
Rock outcrop	0-60	---	---	0.06-6.00	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Pg	0-10	15-25	1.10-1.40	0.60-2.00	0.16-0.20	Low	2.0-4.0	0.43	0.43	3	12.0-20.0	5.6-7.3
Penlaw	10-23	20-35	1.20-1.60	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.24	0.24		12.0-25.0	5.6-7.3
	23-50	20-35	1.30-1.90	0.06-0.20	0.10-0.16	Moderate	0.0-0.5	0.24	0.24		12.0-25.0	5.6-7.3
	50-65	15-50	1.20-1.80	0.06-0.60	0.12-0.16	Moderate	0.0-0.5	0.24	0.28		15.0-30.0	5.6-7.3
Ph	0-9	10-18	1.20-1.40	0.60-2.00	0.14-0.20	Low	2.0-4.0	0.37	0.37	5	8.0-20.0	4.5-6.0
Philo	9-29	10-18	1.20-1.40	0.60-2.00	0.10-0.20	Low	0.0-0.5	0.32	0.32		6.0-20.0	4.5-6.0
	29-65	5-18	1.20-1.40	2.00-6.00	0.06-0.10	Low	0.0-0.5	0.24	0.28		4.0-10.0	4.5-6.0
Po	0-10	5-15	1.20-1.40	0.60-2.00	0.14-0.23	Low	1.0-4.0	0.37	0.37	5	4.0-19.7	3.6-5.5
Pope	10-40	5-18	1.30-1.60	0.60-6.00	0.10-0.18	Low	0.2-0.8	0.28	0.28		6.1-18.3	3.6-5.5
	40-65	5-20	1.30-1.60	0.60-6.00	0.10-0.18	Low	0.1-0.5	0.28	0.20		5.2-12.0	3.6-5.5
Pu	0-7	18-35	1.30-1.50	0.20-0.60	0.18-0.24	Moderate	2.0-4.0	0.43	0.43	3	15.0-25.0	3.5-5.5
Purdy	7-40	35-50	1.30-1.60	0.00-0.20	0.12-0.18	Moderate	0.0-0.5	0.32	0.32		15.0-25.0	3.5-5.5
	40-65	35-50	1.30-1.60	0.00-0.20	0.10-0.16	Moderate	0.0-0.5	0.32	0.32		15.0-25.0	3.5-5.5
Q*.												
Quarries												
SeB	0-8	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
Sideling	8-35	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	35-65	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
SeC	0-8	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
Sideling	8-35	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	35-65	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
SeD	0-8	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
Sideling	8-35	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	35-65	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
SrB	0-4	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
Sideling	4-38	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	38-74	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
SrD	0-4	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
Sideling	4-38	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	38-74	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
SSF*:												
Sideling	0-4	10-26	1.20-1.50	2.00-6.00	0.10-0.14	Low	0.5-2.0	0.20	0.37	5	15.0-30.0	4.5-6.0
	4-38	18-35	1.40-1.60	0.60-2.00	0.10-0.14	Low	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
	38-74	27-45	1.40-1.70	0.06-0.20	0.06-0.20	High	0.0-0.5	0.15	0.28		20.0-40.0	4.5-6.0
Hazleton	0-10	7-18	1.20-1.40	2.00-6.00	0.10-0.16	Low	2.0-4.0	0.15	0.17	3	15.0-30.0	3.5-5.5
	10-42	7-18	1.20-1.40	2.00-20.00	0.08-0.12	Low	0.0-0.5	0.15	0.20		5.0-15.0	3.5-5.5
	42-65	5-15	1.20-1.40	2.00-20.00	0.06-0.12	Low	0.0-0.5	0.15	0.20		3.0-8.0	3.5-5.5
	65-75	---	---	2.00-6.00	---	---	---	---	---		---	---
Ty	0-8	14-26	1.30-1.50	0.60-2.00	0.18-0.22	Low	2.0-4.0	0.43	0.43	3	10.0-24.0	3.6-6.5
Tyler	8-30	20-33	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	0.5-1.0	0.43	0.43		8.0-20.0	3.6-5.5
	30-40	18-33	1.60-1.85	0.00-0.20	0.04-0.12	Low	0.2-0.5	0.43	0.49		7.0-20.0	3.6-5.5
	40-65	12-30	1.30-1.70	0.20-0.60	0.04-0.12	Low	0.1-0.3	0.43	0.49		5.0-18.0	4.5-5.5
Uu*:												
Urban land.												
Udorthents	0-4	20-60	1.40-1.80	0.06-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.32	3	20.0-30.0	5.1-7.3
	4-65	30-60	1.50-1.80	0.06-2.00	0.10-0.24	Moderate	0.0-0.5	0.28	0.32		20.0-30.0	5.1-7.3

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
WeB	0-8	15-27	1.20-1.40	2.00-6.00	0.08-0.14	Low	1.0-4.0	0.20	0.28	2	6.0-20.0	4.5-6.0
Weikert	8-18	15-27	1.20-1.40	2.00-6.00	0.04-0.08	Low	0.0-0.5	0.20	0.32		6.0-15.0	4.5-6.0
	18	---	---	0.60-20.00	---	---	---	---	---		---	---
WeC	0-6	15-27	1.20-1.40	2.00-6.00	0.08-0.14	Low	1.0-4.0	0.20	0.28	2	6.0-20.0	4.5-6.0
Weikert	6-18	15-27	1.20-1.40	2.00-6.00	0.04-0.08	Low	0.0-0.5	0.20	0.32		6.0-15.0	4.5-6.0
	18	---	---	0.60-20.00	---	---	---	---	---		---	---
WeD	0-4	15-27	1.20-1.40	2.00-6.00	0.08-0.14	Low	1.0-4.0	0.20	0.28	2	6.0-20.0	4.5-6.0
Weikert	4-18	15-27	1.20-1.40	2.00-6.00	0.04-0.08	Low	0.0-0.5	0.20	0.32		6.0-15.0	4.5-6.0
	18	---	---	0.60-20.00	---	---	---	---	---		---	---
WuB*:												
Wurno	0-7	10-27	1.20-1.50	0.60-2.00	0.07-0.20	Low	1.0-2.0	0.28	0.32	3	5.0-15.0	6.1-7.8
	7-11	20-35	1.30-1.60	0.60-2.00	0.03-0.14	Low	0.0-0.5	0.17	0.24		5.0-15.0	5.1-7.8
	11-26	10-27	1.30-1.60	0.60-2.00	0.03-0.10	Low	0.0-0.5	0.17	0.24		5.0-15.0	6.6-7.8
	26-31	---	---	0.60-2.00	---	---	---	---	---		---	---
	31-41	---	---	0.60-2.00	---	---	---	---	---			
Nollville	0-10	15-27	1.10-1.40	0.60-2.00	0.14-0.20	Low	1.0-4.0	0.28	0.37	3	12.0-20.0	5.1-7.3
	10-29	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.3
	29-41	25-45	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.8
	41-57	25-45	1.30-1.60	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.49		12.0-20.0	5.1-7.9
	57-67	---	---	0.60-2.00	---	---	---	---	---		---	---
WuC*:												
Wurno	0-7	10-27	1.20-1.50	0.60-2.00	0.07-0.20	Low	1.0-2.0	0.28	0.32	3	5.0-15.0	6.1-7.8
	7-11	20-35	1.30-1.60	0.60-2.00	0.03-0.14	Low	0.0-0.5	0.17	0.24		5.0-15.0	5.1-7.8
	11-26	10-27	1.30-1.60	0.60-2.00	0.03-0.10	Low	0.0-0.5	0.17	0.24		5.0-15.0	6.6-7.8
	26-31	---	---	0.06-2.00	---	---	---	---	---		---	---
	31-41	---	---	0.06-2.00	---	---	---	---	---		---	
Nollville	0-10	15-27	1.10-1.40	0.60-2.00	0.14-0.20	Low	1.0-4.0	0.28	0.37	3	12.0-20.0	5.1-7.3
	10-29	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.3
	29-41	25-45	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.8
	41-57	25-45	1.30-1.60	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.49		12.0-20.0	5.1-7.8
	57-67	---	---	0.60-2.00	---	---	---	---	---		---	---
WuD*:												
Wurno	0-4	10-27	1.20-1.50	0.60-2.00	0.07-0.20	Low	1.0-2.0	0.28	0.32	3	5.0-15.0	6.1-7.8
	4-11	20-35	1.30-1.60	0.60-2.00	0.03-0.14	Low	0.0-0.5	0.17	0.24		5.0-15.0	5.1-7.8
	11-26	10-27	1.30-1.60	0.60-2.00	0.03-0.10	Low	0.0-0.5	0.17	0.24		5.0-15.0	6.6-7.8
	26-31	---	---	0.60-2.00	---	---	---	---	---		---	---
	31-41	---	---	0.60-2.00	---	---	---	---	---		---	---
Nollville	0-8	15-27	1.10-1.40	0.60-2.00	0.14-0.20	Low	1.0-4.0	0.28	0.37	3	12.0-20.0	5.1-7.3
	8-27	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.3
	27-39	25-45	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.8
	39-55	25-45	1.30-1.60	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.49		12.0-20.0	5.1-7.8
	55-65	---	---	0.60-2.00	---	---	---	---	---		---	---
WuE*:												
Wurno	0-4	10-27	1.20-1.50	0.60-2.00	0.07-0.20	Low	1.0-2.0	0.28	0.32	3	5.0-15.0	6.1-7.8
	4-11	20-35	1.30-1.60	0.60-2.00	0.03-0.14	Low	0.0-0.5	0.17	0.24		5.0-15.0	5.1-7.8
	11-25	10-27	1.30-1.60	0.60-2.00	0.03-0.10	Low	0.0-0.5	0.17	0.24		5.0-15.0	6.6-7.8
	25-31	---	---	0.60-2.00	---	---	---	---	---		---	---
	31-36	---	---	0.60-2.00	---	---	---	---	---		---	---

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Cation-exchange capacity	Soil reaction
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
WuE*:												
Nollville-------	0-6	15-27	1.10-1.40	0.60-2.00	0.14-0.20	Low	1.0-4.0	0.28	0.37	3	12.0-20.0	5.1-7.3
	6-26	25-35	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.3
	26-38	25-45	1.30-1.50	0.60-2.00	0.14-0.20	Moderate	0.0-0.5	0.28	0.37		12.0-20.0	5.1-7.8
	38-54	25-45	1.30-1.60	0.60-2.00	0.12-0.16	Moderate	0.0-0.5	0.28	0.49		12.0-20.0	5.1-7.8
	54-64	---	---	0.60-2.00	---	---	---	---	---		---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Soil Features

("Bedrock" and "risk of corrosion" and terms such as "low," moderate," or "high" are explained in text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
AgB Allegheny	>60	---	Low	Low	High.
AnB Andover	>60	---	High	High	High.
AoB Andover	>60	---	High	High	High.
As Atkins	>60	---	High	High	Moderate.
Be Barbour	>60	---	Moderate	Low	Moderate.
Bf Basher	>60	---	High	Moderate	Moderate.
BhB Bedington	>60	---	Moderate	Low	High.
BhC Bedington	>60	---	Moderate	Low	High.
BhD Bedington	>60	---	Moderate	Low	High.
BkB Berks	20-40	Soft	Low	Low	High.
BkC Berks	20-40	Soft	Low	Low	High.
BkD Berks	20-40	Soft	Low	Low	High.
BrA BRinkerton	>60	---	High	High	High.
BrB Brinkerton	>60	---	High	High	High.
BuB Buchanan	>60	---	Moderate	High	High.
BuC Buchanan	>60	---	Moderate	High	High.
BxB Buchanan	>60	---	Moderate	High	High.
BxD Buchanan	>60	---	Moderate	High	High.

See footnote at end of table.

Table 16.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
CaB---------- Calvin	20-40	Soft	Moderate----	Low---------	Moderate.
CaC---------- Calvin	20-40	Soft	Moderate----	Low---------	Moderate.
CaD---------- Calvin	20-40	Soft	Moderate----	Low---------	Moderate.
CkB*:					
Calvin----------	20-40	Soft	Moderate----	Low---------	Moderate.
Leck Kill-------	40-60	Soft	Moderate----	Low---------	Moderate.
CoC---------- Carbo	20-40	Hard	Moderate----	High--------	Low.
CoD---------- Carbo	20-40	Hard	Moderate----	High--------	Low.
CrC---------- Cedarcreek	>60	---	Moderate----	Moderate	High.
CrF---------- Cedarcreek	>60	---	Moderate----	Moderate	High.
CsB---------- Cedarcreek	>60	---	Moderate----	Moderate	Moderate.
DEF*:					
Dekalb----------	20-40	Hard	Low---------	Low---------	High.
Hazleton--------	>60	---	Moderate----	Low---------	High.
EgB---------- Elliber	>60	---	Moderate----	Low---------	High.
EgC---------- Elliber	>60	---	Moderate----	Low---------	High.
EgD---------- Elliber	>60	---	Moderate----	Low---------	High.
ErB---------- Ernest	>60	---	Moderate----	Moderate	Moderate.
FrB---------- Frankstown	>60	---	Moderate----	Moderate	Moderate.
FrC---------- Frankstown	>60	---	Moderate----	Moderate	Moderate.
FrD---------- Frankstown	>60	---	Moderate----	Moderate	Moderate.
FrE---------- Frankstown	>60	---	Moderate----	Moderate	Moderate.
Fu---------- Funkstown	>60	---	Moderate----	Moderate	Low.

See footnote at end of table.

Table 16.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
HaB---------- Hagerstown	>60	---	Moderate----	Moderate	Low.
HaC---------- Hagerstown	>60	---	Moderate----	Moderate	Low.
HbB*:					
Hagerstown------	>60	---	Moderate----	Moderate	Low.
Carbo----------	20-40	Hard	Moderate----	High--------	Low.
HkE*:					
Hagerstown------	>60	---	Moderate----	Moderate	Low.
Rock outcrop----	---	Hard	None--------	---	---
HOD*:					
Hazleton--------	>60	---	Moderate----	Low---------	High.
Clymer----------	40-60	Hard	Moderate----	Low---------	High.
HRB*:					
Hazleton--------	>60	---	Moderate----	Low---------	High.
Dekalb----------	20-40	Hard	Low---------	Low---------	High.
HRD*:					
Hazleton--------	>60	---	Moderate----	Low---------	High.
Dekalb----------	20-40	Hard	Low---------	Low---------	High.
HRF*:					
Hazleton--------	>60	---	Moderate----	Low---------	High.
Dekalb----------	20-40	Hard	Low---------	Low---------	High.
HwB---------- Hustontown	>60	---	High--------	High--------	High.
Jg*:					
Jugtown---------	>60	---	High--------	Moderate----	Low.
Lindside--------	>60	---	High--------	Moderate----	Low.
KaB---------- Klinesville	10-20	Soft	Moderate----	Moderate	High.
KaC---------- Klinesville	10-20	Soft	Moderate----	Moderate	High.
KaD---------- Klinesville	10-20	Soft	Moderate----	Moderate	High.
KWF*:					
Klinesville-----	10-20	Soft	Moderate----	Moderate	High.
Weikert---------	10-20	Soft	Moderate----	Moderate	Moderate.
LaB---------- Laidig	>60	---	Moderate----	Moderate	High.

See footnote at end of table.

Table 16.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
LaC---------- Laidig	>60	---	Moderate----	Moderate	High.
LbB---------- Laidig	>60	---	Moderate----	Moderate	High.
LbD---------- Laidig	>60	---	Moderate----	Moderate	High.
LCE*:					
Laidig----------	>60	---	Moderate----	Moderate	High.
Hazleton--------	>60	---	Moderate----	Low---------	High.
Ln---------- Lindside	>60	---	High--------	Moderate----	Low.
Me---------- Melvin	>60	---	High--------	High--------	Low.
MoB---------- Monongahela	>60	---	Moderate----	High--------	High.
MrB---------- Murrill	>60	---	Moderate----	High--------	Moderate.
MrC---------- Murrill	>60	---	Moderate----	High--------	Moderate.
MvD---------- Murrill	>60	---	Moderate----	Moderate	High.
PcB---------- Pecktonville	>60	---	Moderate----	Moderate	High.
PcC---------- Pecktonville	>60	---	Moderate----	Moderate	High.
PeE*:					
Pecktonville----	>60	---	Moderate----	Moderate	High.
Rock outcrop----	---	Hard	None--------	---	---
Pg---------- Penlaw	>60	---	High--------	High--------	Moderate.
Ph---------- Philo	>60	---	Moderate----	Low---------	High.
Po---------- Pope	>60	---	Moderate----	Low---------	High.
Pu---------- Purdy	>60	---	High--------	High--------	High.
Q*---------- Quarries	---	Hard	None--------	---	---
SeB---------- Sideling	>60	---	Moderate----	High--------	Moderate.

See footnote at end of table.

Table 16.--Soil Features--Continued

Map symbol and soil name	Bedrock		Potential frost action	Risk of corrosion	
	Depth	Hardness		Uncoated steel	Concrete
	In				
SeC--Sideling	>60	---	Moderate	High	Moderate.
SeD--Sideling	>60	---	Moderate	High	Moderate.
SrB--Sideling	>60	---	Moderate	High	Moderate.
SrD--Sideling	>60	---	Moderate	High	Moderate.
SSF*:					
Sideling	>60	---	Moderate	High	Moderate.
Hazleton	>60	---	Moderate	Low	High.
Ty--Tyler	>60	---	High	High	High.
Uu*:					
Urban land	---	---	None	---	---
Udorthents	>20	Hard	Moderate	High	Low.
WeB--Weikert	10-20	Soft	Moderate	Moderate	Moderate.
WeC--Weikert	10-20	Soft	Moderate	Moderate	Moderate.
WeD--Weikert	10-20	Soft	Moderate	Moderate	Moderate.
WuB*:					
Wurno	20-40	Soft	Moderate	Low	Low.
Nollville	40-60	Soft	Moderate	Moderate	Moderate.
WuC*:					
Wurno	20-40	Soft	Moderate	Low	Low.
Nollville	40-60	Soft	Moderate	Moderate	Moderate.
WuD*:					
Wruno	20-40	Soft	Moderate	Low	Low.
Nollville	40-60	Soft	Moderate	Moderate	Moderate.
WuE*:					
Wurno	20-40	Soft	Moderate	Low	Low.
Nollville	40-60	Soft	Moderate	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
AgB--- Allegheny	B	None	---	---	>6.0	---	---	---	---
AnB--- Andover	D	None	---	---	0.0-0.5	Perched	Oct-Jun	---	---
AoB--- Andover	D	None	---	---	0.0-0.5	Perched	Oct-Jun	---	---
As--- Atkins	D	Frequent	Very brief	Sep-Jul	0.0-1.0	Apparent	Nov-Jun	---	---
Be--- Barbour	B	Frequent	Brief	Dec-Apr	3.0-6.0	Apparent	Jan-Apr	---	---
Bf--- Basher	B	Frequent	Brief	Dec-Apr	1.5-2.0	Apparent	Jan-May	---	---
BhB--- Bedington	B	None	---	---	>6.0	---	---	---	---
BhC--- Bedington	B	None	---	---	>6.0	---	---	---	---
BhD--- Bedington	B	None	---	---	>6.0	---	---	---	---
BkB--- Berks	C	None	---	---	>6.0	---	---	---	---
BkC--- Berks	C	None	---	---	>6.0	---	---	---	---
BkD--- Berks	C	None	---	---	>6.0	---	---	---	---
BrA--- Brinkerton	D	None	---	---	0.0-0.5	Perched	Oct-May	---	---
BrB--- Brinkerton	D	None	---	---	0.0-0.5	Perched	Oct-May	---	---
BuB--- Buchanan	C	None	---	---	1.5-3.0	Perched	Nov-Mar	---	---
BuC--- Buchanan	C	None	---	---	1.5-3.0	Perched	Nov-Mar	---	---
BxB--- Buchanan	C	None	---	---	1.5-3.0	Perched	Nov-Mar	---	---
BxD--- Buchanan	C	None	---	---	1.5-3.0	Perched	Nov-Mar	---	---
CaB--- Calvin	C	None	---	---	>6.0	---	---	---	---

See footnote at end of table.

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
CaC--Calvin	C	None	---	---	>6.0	---	---	---	---
CaD--Calvin	C	None	---	---	>6.0	---	---	---	---
CkB*:									
Calvin	C	None	---	---	>6.0	---	---	---	---
Leck Kill	B	None	---	---	>6.0	---	---	---	---
CoC--Carbo	C	None	---	---	>6.0	---	---	---	---
CoD--Carbo	C	None	---	---	>6.0	---	---	---	---
CrC--Cedarcreek	C	None	---	---	>6.0	---	---	---	---
CrF--Cedarcreek	C	None	---	---	>6.0	---	---	---	---
CsB--Clarksburg	C	None	---	---	1.5-3.0	Perched	Nov-Mar	---	---
DEF*:									
Dekalb	B	None	---	---	>6.0	---	---	---	---
Hazleton	B	None	---	---	>6.0	---	---	---	---
EgB--Elliber	A	None	---	---	>6.0	---	---	---	---
EgC--Elliber	A	None	---	---	>6.0	---	---	---	---
EgD--Elliber	A	None	---	---	>6.0	---	---	---	---
ErB--Ernest	C	None	---	---	1.5-3.0	Perched	Dec-Apr	---	---
FrB--Frankstown	B	None	---	---	>6.0	---	---	---	---
FrC--Frankstown	B	None	---	---	>6.0	---	---	---	---
FrD--Frankstown	B	None	---	---	>6.0	---	---	---	---
FrE--Frankstown	B	None	---	---	>6.0	---	---	---	---
Fu--Funkstown	B	Frequent	Very brief	Jan-Apr	2.0-3.5	Apparent	Dec-Apr	---	---
HaB--Hagerstown	B	None	---	---	>6.0	---	---	---	---

See footnote at end of table.

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				Maximum ponding depth
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	
					Ft				Ft
HaC---------- Hagerstown	B	None	---	---	>6.0	---	---	---	---
HbB*:									
Hagerstown------	B	None	---	---	>6.0	---	---	---	---
Carbo----------	C	None	---	---	>6.0	---	---	---	---
HkE*:									
Hagerstown------	B	None	---	---	>6.0	---	---	---	---
Rock outcrop----	D	None	---	---	>6.0	---	---	---	---
HOD*:									
Hazleton--------	B	None	---	---	>6.0	---	---	---	---
Clymer----------	B	None	---	---	>6.0	---	---	---	---
HRB*:									
Hazleton--------	B	None	---	---	>6.0	---	---	---	---
Dekalb----------	A	None	---	---	>6.0	---	---	---	---
HRD*:									
Hazleton--------	B	None	---	---	>6.0	---	---	---	---
Dekalb----------	A	None	---	---	>6.0	---	---	---	---
HRF*:									
Hazleton--------	B	None	---	---	>6.0	---	---	---	---
Dekalb----------	A	None	---	---	>6.0	---	---	---	---
HwB:									
Hustontown------	C	None	---	---	1.5-3.0	Perched	Nov-May	---	---
Jg*:									
Jugtown---------	C	Occasional	Brief	Dec-Apr	1.5-2.5	Apparent	Dec-Apr	---	---
Lindside--------	C	Frequent	Brief	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	---	---
KaB---------- Klinesville	C	None	---	---	>6.0	---	---	---	---
KaC---------- Klinesville	C	None	---	---	>6.0	---	---	---	---
KaD----------	C	None	---	---	>6.0	---	---	---	---
KWF*:									
Klinesville-----	C	None	---	---	>6.0	---	---	---	---
Weikert---------	C	None	---	---	>6.0	---	---	---	---
LaB---------- Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	---	---
LaC---------- Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	---	---

See footnote at end of table.

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
LbB---------- Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	---	---
LbD---------- Laidig	C	None	---	---	2.5-4.0	Perched	Jan-Mar	---	---
LCE*:									
Laidig----------	C	None	---	---	2.5-4.0	Perched	Jan-Mar	---	---
Hazleton--------	B	None	---	---	>6.0	---	---	---	---
Ln---------- Lindside	C	Frequent	Brief	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	---	---
Me---------- Melvin	D	Frequent	Brief	Dec-May	0.0-1.0	Apparent	Dec-May	---	---
MoB---------- Monongahela	C	None	---	---	1.5-3.0	Perched	Dec-Apr	---	---
MrB---------- Murrill	B	None	---	---	>6.0	---	---	---	---
MrC---------- Murrill	B	None	---	---	>6.0	---	---	---	---
MvD---------- Murrill	B	None	---	---	>6.0	---	---	---	---
PcB---------- Pecktonville	C	None	---	---	3.5-6.0	Apparent	Dec-Apr	---	---
PcC---------- Pecktonville	C	None	---	---	3.5-6.0	Apparent	Dec-Apr	---	---
PeE*:									
Pecktonville----	C	None	---	---	3.5-6.0	Apparent	Dec-Apr	---	---
Rock outcrop----	D	None	---	---	>6.0	---	---	---	---
Pg---------- Penlaw	C	None	---	---	0.5-1.5	Perched	Nov-Mar	---	---
Ph---------- Philo	B	Frequent	Very brief	Dec-May	1.5-3.0	Apparent	Dec-Apr	---	---
Po---------- Pope	B	Occasional	Brief	Nov-Apr	>6.0	---	---	---	---
Pu---------- Purdy	D	None	---	---	1.0-0.5	Apparent	Nov-Jun	Long	1.0
Q*---------- Quarries		None	---	---	>6.0	---	---	---	---
SeB---------- Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---
SeC---------- Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---

See footnote at end of table.

Table 17.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table and ponding				
		Frequency	Duration	Months	Water table depth	Kind of water table	Months	Ponding duration	Maximum ponding depth
					Ft				Ft
SeD--Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---
SrB--Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---
SrD--Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---
SSF*:									
Sideling	C	None	---	---	2.5-4.0	Perched	Dec-Apr	---	---
Hazleton	B	None	---	---	>6.0	---	---	---	---
Ty--Tyler	D	None	---	---	0.5-2.0	Perched	Nov-May	---	---
Uu*									
Urban land		None	---	---	>2.0	---	---	---	---
Udorthents	C	None	---	---	>6.0	---	---	---	---
WeB--Weikert	C	None	---	---	>6.0	---	---	---	---
WeC--Weikert	C	None	---	---	>6.0	---	---	---	---
WeD--Weikert	C	None	---	---	>6.0	---	---	---	---
WuB*:									
Wurno	C	None	---	---	>6.0	---	---	---	---
Nollville	B	None	---	---	>6.0	---	---	---	---
WuC*:									
Wurno	C	None	---	---	>6.0	---	---	---	---
Nollville	B	None	---	---	>6.0	---	---	---	---
WuD*:									
Wurno	C	None	---	---	>6.0	---	---	---	---
Nollville	B	None	---	---	>6.0	---	---	---	---
WuE*:									
Wurno	C	None	---	---	>6.0	---	---	---	---
Nollville	B	None	---	---	>6.0	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 18.--Hydric Soil Map Units with Hydric Inclusions

(The "Hydric soils criteria" columns indicate the conditions that caused the map unit to be classified as "Hydric" or "Non-Hydric." These criteria are defined in "Hydric Soils of the United States," USDA Miscellaneous Publication No. 1491, June 1991. The "FSA criteria and information" column contains information needed for the Food Security Act determinations required by Sec. 512.11(h)(4) of the National Food Security Manual (August 1991). In the "Natural condition of the soil" column, "Wooded" means the soil supports woody vegetation under natural conditions, and "Farmable" means the soil can be farmed under natural conditions without such manipulation as removing woody vegetation)

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
AnB:								
Andover gravelly loam, 3 to 8 percent slopes	Andover (C)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Buchanan soils (I)	No						
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Philo soils (I)	No						
	Swampy areas (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Sideling soils (I)	No						
AoB:								
Andover gravelly loam, 0 to 8 percent slopes, very stony	Andover (C)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Buchanan soils (I)	No						
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Philo soils (I)	No						
	Swampy areas (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Sideling soils (I)	No						
As:								
Atkins silt loam	Atkins (C)	Yes	Flood plains	2B3	Yes	No	No	Wooded
	Ernest soils (I)	No						
	Brinkerton soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Tyler soils (I)	No						
	Pope soils (I)	No						

See footnote at end of table.

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
Be:								
Barbour fine sandy loam	Barbour (C)	No						
	Birdsboro soils (I)	No						
	Hustontown soils (I)	No						
	Brinkerton soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Soils that pond water (I)	Yes	Depressions	2B3,4	Yes	No	Yes	Wooded.
Bf:								
Basher fine sandy loam	Basher (C)	No						
	Hustontown soils (I)	No						
	Very stony areas (I)	No						
	Brinkerton soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Farmable.
	Very poorly drained soils (I)	Yes	Depressions	2B3,3	Yes	No	Yes	Wooded.
BrA:								
Brinkerton silt loam, 0 to 3 percent slopes	Brinkerton (C)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Philo soils (I)	No						
	Laidig soils (I)	No						
	Berks soils (I)	No						
BrB:								
Brinkerton silt loam, 3 to 8 percent slopes	Brinkerton (C)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Ernest soils (I)	No						
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Wooded.
	Philo soils (I)	No						
	Laidig soils (I)	No						
	Berks soils (I)	No						

See footnote at end of table.

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
BuB:								
Buchanan gravelly loam, 3 to 8 percent slopes	Buchanan (C)-	No						
	Andover soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Alluvial soils (I)	No						
	Berks soils (I)	No						
	Bedington soils (I)	No						
	Springs and seeps (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
BuC:								
Buchanan gravelly loam, 8 to 15 percent slopes	Buchanan (C)-	No						
	Andover soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Alluvial soils (I)	No						
	Berks soils (I)	No						
	Bedington soils (I)	No						
	Springs and seeps (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
BxB:								
Buchanan cobbly loam, 0 to 8 percent slopes, extremely stony	Buchanan (C)-	No						
	Andover soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Alluvial soils (I)	No						
	Berks soils (I)	No						
BxD:								
Buchanan cobbly loam, 8 to 25 percent slopes, extremely stony	Buchanan (C)-	No						
	Andover soils (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Alluvial soils (I)	No						
	Berks soils (I)	No						
	Bedington soils (I)	No						
	Hazleton soils (I)	No						
	Springs and seeps (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.

See footnote at end of table

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component (C)/ Inclusion (I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
CrC:								
Cedarcreek very channery loam, 3 to 25 percent slopes	Cedarcreek (C)	No						
	Buchanan soils (I)	No						
	Hazleton soils (I)	No						
	Poorly drained soil materials (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Exposed highwall and bedrock (I)	No						
CrF:								
Cedarcreek extremely channery loam, 25 to 80 percent slopes	Cedarcreek (C)	No						
	High wall or exposed bedrock (I)	No						
	Poorly drained soil material (I)	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Buchanan soils (I)	No						
	Hazleton soils (I)	No						
ErB:								
Ernest silt loam, 3 to 8 percent slopes	Ernest (C)	No						
	Brinkerton soils (I)	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Atkins soils (I)	Yes	Flood plains	2B3	Yes	No	No	Farmable.
	Philo soils (I)	No						
	Small seeps and springs (I)	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Berks soils (I)	No						

See footnote at end of table.

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
HwB:								
Hustontown silt loam, 3 to 8 percent slopes-	Hustontown (C)---	No						
	Calvin soils (I)---	No						
	Leck Kill soils (I)---	No						
	Moderately well drained soils (I)---	No						
	Brinkerton soils (I)---	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Basher soils (I)---	No						
Jg*:								
Jugtown-Lindside silt loams----------	Jugtown (C)--	No						
	Lindside (C)-	No						
	Clarksburg soils (I)---	No						
	Monongahela soils (I)---	No						
	Melvin soils (I)---	Yes	Flood plains	2B3	Yes	No	No	Farmable.
	Very gravelly areas (I)---	No						
LbB:								
Laidig gravelly loam, 0 to 8 percent slopes, extremely stony----------	Laidig (C)---	No						
	Buchanan soils (I)---	No						
	Berks soils (I)---	No						
	Andover soils (I)---	Yes	Depressions	2B3	Yes	No	No	Wooded.
LbD:								
Laidig channery loam, 8 to 25 percent slopes, extremely stony----------	Laidig (C)---	No						
	Buchanan soils (I)---	No						
	Berks soils (I)---	No						
	Andover soils (I)---	Yes	Depressions	2B3	Yes	No	No	Wooded.

See footnote at end of table.

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
Ln:								
Lindside silt loam----	Lindside (C)-	No						
	Clarksburg soils (I)---	No						
	Monongahela soils (I)---	No						
	Melvin soils (I)---------	Yes	Depressions	2B3	Yes	No	No	Wooded.
MoB:								
Monongahela silt loam, 3 to 8 percent slopes----------	Monongahela (C)---------	No						
	Purdy soils (I)---------	Yes	Depressions	2B3,3	Yes	No	Yes	Farmable.
	Brinkerton soils (I)---	Yes	Depressions	2B3	YES	NO	NO	Farmable.
	Steep slopes (I)---------	No						
	Shallower soils (I)---	No						
Pg:								
Penlaw silt loam, 0 to 3 percent slopes---	Penlaw (C)---	No						
	Poorly drained soils (I)---	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Melvin soils (I)---------	Yes	Depressions	2B3	Yes	No	No	Wooded.
	Murrill soils (I)---------	No						
	Hagerstown Soils (I)---	No						
Ph:								
Philo silt loam-------	Philo (C)----	No						
	Ernest soils (I)---------	No						
	Brinkerton soils (I)---	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Atkins soils (I)---------	Yes	Flood plains	2B3	Yes	No	No	Farmable.
Po:								
Pope silt loam--------	Pope (C)-----	No						
	Ernest soils (I)---------	No						
	Brinkerton soils (I)---	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Atkins soils (I)---------	Yes	Flood plains	2B3	Yes	No	No	Farmable.
	Monongahela soils (I)---	No						

See footnote at end of table.

Table 18.--Hydric Soil Map Units with Hydric Inclusions--Continued

Map symbol and map unit name	Component(C)/ Inclusion(I)	Hydric	Local landform	Hydric soils criteria				FSA criteria and information
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria	Natural condition of the soil
Ty:								
Tyler silt loam, 0 to 3 percent slopes------	Tyler (C)----	No						
	Brinkerton soils (I)---	Yes	Depressions	2B3	Yes	No	No	Farmable.
	Purdy soils (I)---------	Yes	Terraces	2B3	Yes	No	Yes	Farmable.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 19.--Classification of the Soils

(The classification report does not include recent amendments to soil taxonomy for cation exchange activity, particle size modifier, and dual mineralogy for strongly contrasting classes. For more detailed information contact the local field office or the State office of the Natural Resources Conservation Service)

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, mesic Typic Hapludults
Andover	Fine-loamy, mixed, mesic Typic Fragiaquults
Atkins	Fine-loamy, mixed, acid, mesic Typic Fluvaquents
Barbour	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrochrepts
Basher	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Bedington	Fine-loamy, mixed, mesic Typic Hapludults
Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Brinkerton	Fine-silty, mixed, mesic Typic Fragiaqualfs
Buchanan	Fine-loamy, mixed, mesic, Aquic Fragiudults
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Carbo	Very-fine, mixed, mesic Typic Hapludalfs
Cedarcreek	Loamy-skeletal, mixed, acid, mesic Typic Udorthents
Clarksburg	Fine-loamy, mixed, mesic Oxyaquic Fragiudalfs
Clymer	Fine-loamy, mixed, mesic Typic Hapludults
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Elliber	Loamy-skeletal, mixed, mesic Typic Hapludults
Ernest	Fine-loamy, mixed, mesic Aquic Fragiudults
Frankstown	Fine-loamy, mixed, mesic Typic Hapludults
Funkstown	Fine-loamy, mixed, mesic Oxyaquic Hapludalfs
Hagerstown	Fine, mixed, mesic Typic Hapludalfs
Hazleton	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Hustontown	Fine-loamy, mixed, mesic Oxyaquic Fragiudalfs
Jugtown	Fine-loamy, mixed, mesic Aquic Hapludalfs
Klinesville	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Laidig	Fine-loamy, siliceous, mesic Typic Fragiudults
Leck Kill	Fine-loamy, mixed, mesic Typic Hapludults
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Monongahela	Fine-loamy, mixed, mesic Typic Fragiudults
Murrill	Fine-loamy, mixed, mesic Typic Hapludults
Nollville	Fine-loamy, mixed, mesic Typic Hapludalfs
Pecktonville	Clayey, mixed, mesic Typic Paleudults
Penlaw	Fine-silty, mixed, mesic Aquic Fragiudalfs
Philo	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Pope	Coarse, loamy, mixed, mesic Fluventic Dystrochrepts
Purdy	Clayey, mixed, mesic Typic Endoaquults
Sideling	Fine-loamy, siliceous, mesic Oxyaquic Hapludults
Tyler	Fine-silty, mixed, mesic Aeric Fragiaquults
Udorthents	Udorthents
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Wurno	Loamy-skeletal, mixed, mesic Dystric Eutrochrepts

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Persons with Disabilities

If you are deaf, are hard of hearing, or have speech disabilities and you wish to file either an EEO or program complaint, please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

If you have other disabilities and wish to file a program complaint, please see the contact information above. If you require alternative means of communication for

program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Supplemental Nutrition Assistance Program

For additional information dealing with Supplemental Nutrition Assistance Program (SNAP) issues, call either the USDA SNAP Hotline Number at (800) 221-5689, which is also in Spanish, or the State Information/Hotline Numbers (http://directives.sc.egov.usda.gov/33085.wba).

All Other Inquiries

For information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices (http://directives.sc.egov.usda.gov/33086.wba).