United States
Department of
Agriculture

Natural
Resources
Conservation
Service

United States
Department of the
Interior

National Park
Service

Soil Survey of New River Gorge National River, West Virginia

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, 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.

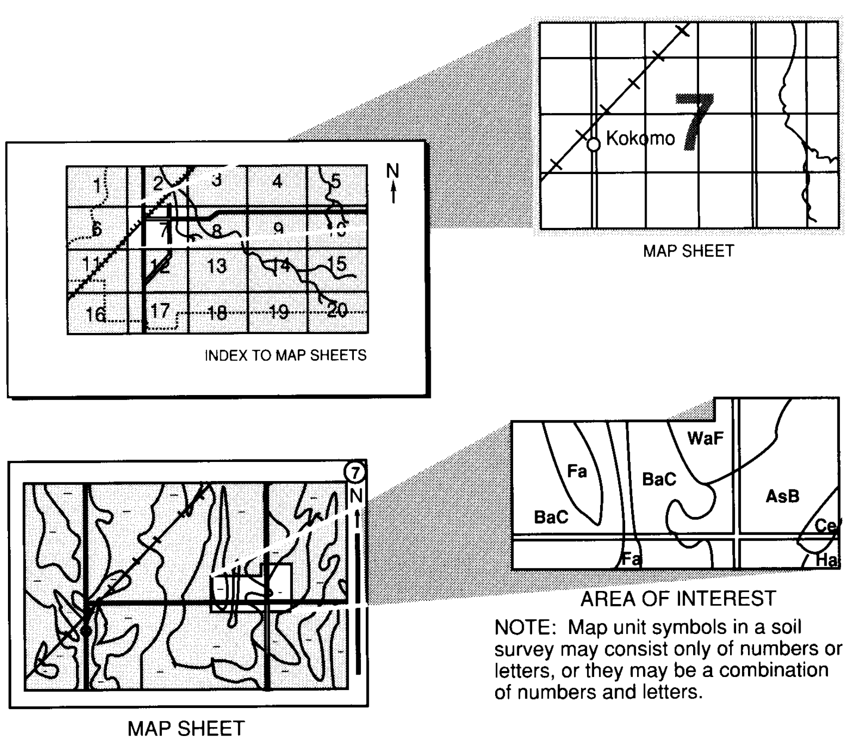
Detailed Soil Maps

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

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

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.



National Cooperative Soil Survey

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 has leadership for the Federal part of the National Cooperative Soil Survey.

The 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, the maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Literature Citation

The correct citation for this survey is as follows:

United States Department of Agriculture, Natural Resources Conservation Service, and United States Department of the Interior, National Park Service. 2013. Soil survey of New River Gorge National River, West Virginia. (Accessible online at: http://soils.usda.gov/survey/printed_surveys/)

Cover Caption

The view looking east from the Canyon Rim Visitor Center Overlook. Layland-Dekalb-Rock outcrop complex, 55 to 80 percent slopes, extremely stony is the dominant detailed soil map unit on the steep slopes of the New River Gorge in this area.

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

Nondiscrimination Statement

Nondiscrimination Policy

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the basis of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and where applicable, political beliefs, marital status, familial or parental status, sexual orientation, whether all or part of an individual's income is derived from any public assistance program, or protected genetic information. The Department prohibits discrimination in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases apply to all programs and/or employment activities.)

To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor (http://directives.sc.egov.usda.gov/33081.wba) within 45 days of the date of the alleged discriminatory act, event, or personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html.

To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter by mail to U.S. Department of Agriculture; Director, Office of Adjudication; 1400 Independence Avenue, S.W.; Washington, D.C. 20250-9419; by fax to (202) 690-7442; or by email to program.intake@usda.gov.

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).

Contents

Issued 2013

Foreword

This soil survey was developed in conjunction with the National Park Service's Soil Inventory and Monitoring Program and is intended to serve as the official source document for soils occurring within New River Gorge National River.

This soil survey contains information that affects current and future land use planning in the park. It contains predictions of soil behavior for selected land uses. The survey highlights soil limitations, actions needed to overcome the limitations, and the impact of selected land uses on the environment. It is designed to meet the needs of the National Park Service and its partners to better understand the properties of the soils in the park and the effects of these soil properties on various natural ecological characteristics. This knowledge can help the National Park Service and its partners to 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 map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or at the local headquarters of the National Park Service, at Glen Jean, West Virginia.

Kevin Wickey
State Conservationist
Natural Resources Conservation Service

Soil Survey of
New River Gorge National River, West Virginia

By Wendy Noll and James Bell, Natural Resources Conservation Service

Fieldwork by Steven Baker, James Bell, Charles Delp, Eileen Klein, Wendy Noll, Robert Pate, and Aron Sattler, Natural Resources Conservation Service

Technical support and quality assurance by Susan Southard, David Kingsbury, and Tim Dilliplane, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, and United States Department of the Interior, National Park Service

New River Gorge National River is located in parts of Fayette, Raleigh, and Summers Counties, West Virginia (fig. 1). Established as part of the National Park Service in 1978, the park encompasses more than 70,000 acres of land along the New River and extends along the New River from Hinton, West Virginia, north to Hawks Nest State Park near Anstead, West Virginia, a distance of 53 miles (84.8 kilometers). New River Gorge National River is rich in cultural and natural history and offers an abundance of scenic and recreational opportunities. The New River is a rugged, white-water river that flows northward through deep canyons. It is one of the oldest rivers on the continent.

General Nature of the Survey Area

This section provides general information about the survey area. It discusses the history, environment, and climate of New River Gorge National River.

History

The New River is like a ribbon tying together all the people, places, and events sharing its course through time. New River Gorge National River protects a rich history: from the subsistence lives of the native peoples and the later pioneers, to the advent of the railroad, to the many people involved in the ensuing boom and bust of the coal mining and logging industries.

In 1755, the New River Gorge was the site of one of the great stories of survival and endurance in American history. At that time, the New River area was the far western frontier of English colonial settlement, and England and France were at war for control of North America. The French and Indian War, like all wars, brought its worst horrors to the civilian peoples caught in its path.

Scotch-Irish immigrants to the survey area followed a common migration route. They settled on the far western frontier of the colony of Virginia, on the present-day site of Virginia Tech University in Blacksburg, Virginia. On this site, a small farming settlement, called Drapers Meadows, was established. In July of 1755, Drapers

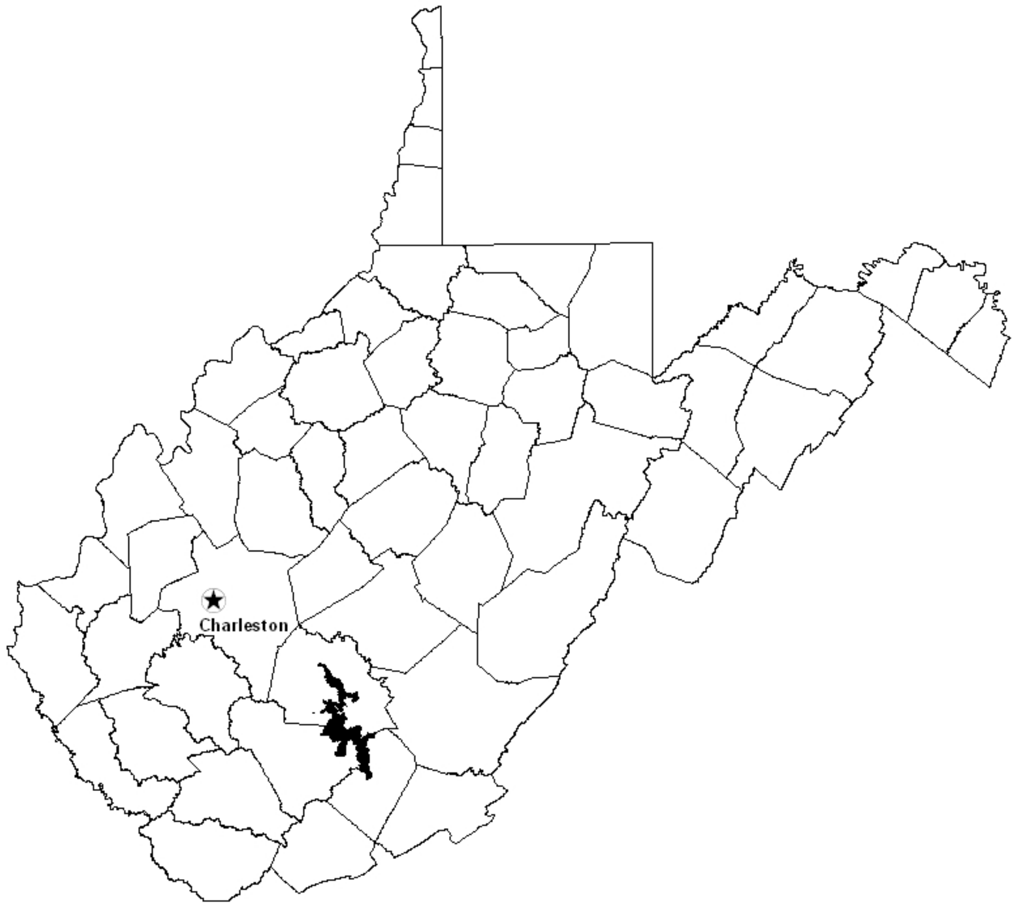


Figure 1.—Location of New River Gorge National River in southern West Virginia.

Meadows was attacked by warriors of the Shawnee Nation, who were allied with France. Five people were killed and four people taken captive, including Mary Draper Ingles and her two sons. The captives began an intense, forced march to the Shawnee home villages near present-day Chillicothe, Ohio. On arrival, Ingles's two boys were taken from her for adoption into the tribe and Mary was given into servitude to a French trader.

By October 1755, Mary and the fourth captive, known from history only as the "old Dutch woman" (referring to a German immigrant), had planned an escape. The two women made their escape into a vast, rugged wilderness in the face of an oncoming winter with no supplies, maps, or equipment. Their determination to endure and their plan to follow the Ohio, Kanawha, and New Rivers eastward to English settlements was their only hope of survival. For 40 days and 500 miles, the women struggled along the riverbanks and the deep rocky gorge of the New River, scavenging for food and shelter and living off the land as best they could. When she finally reached the snow covered remains of Drapers Meadows, Mary Draper Ingles was reunited with her husband. The couple moved to a spot by the New River near Radford Virginia, where they operated a ferry, built a new home, and raised five more children (USDI-NPS, 2011b).

The logging and mining industries have left their mark on the New River Gorge National River area. The Chesapeake and Ohio Railroad (C&O) brought people and wealth to the area. Thurmond, Kaymoor, Glade, and Hamlet became booming industrial towns.

During the first two decades of the 1900s, Thurmond was a classic boomtown. With the huge amounts of coal brought in from area mines, it had the largest revenue on the C&O railway. Having many coal barons among its patrons, Thurmond's banks were the richest in the State. Each day, 15 passenger trains a day came through town; the depot served as many as 95,000 passengers a year. The town's stores and saloons did a remarkable business, and its hotels and boarding houses were constantly overflowing. With the advent of diesel locomotives, and less coal coming in from local mines, the town began a steady decline. The businesses closed down, and most residents moved on.

Today, the town of Thurmond remains surprisingly untouched by modern development. It is a link to the past, and a town with many stories to tell.

Miners came from everywhere to work the mines at Kaymoor. They included experienced miners from neighboring States, blacks migrating from rural areas in the Southeast, and immigrants from southern and eastern European countries. Kaymoor employed more than 800 workers during peak production. Miners were generally paid bimonthly. In December of 1902, Kaymoor paid an average of $30.21 to each of the 321 workers. The pay consisted of $19.03 in cash and $11.58 in scrip (a paper or metal substitute for money that was redeemable only at the company store). Started by the Low Moor Coal Company in the late 1890s, Kaymoor One was one of the largest and most productive coal operations in the gorge. From 1900 to 1962, miners produced 16,904,321 tons of coal from Kaymoor One (USDI-NPS, 2011a).

The company logging towns of Glade and Hamlet once illustrated the cycle of commercial logging in the southern Appalachians. The railroad had opened up the seemingly endless, old-growth deciduous forest. Narrow-gauge branch lines further penetrated the wilderness. Loggers with hand saws, axes, and teams of draft horses cut and dragged the trees from the mountains. Sawmills and mill towns soon appeared. The demand for lumber grew steadily, and Hamlet and Glade rode the boom. The logging practices of the time, however, doomed both the forests and towns. From the 1880s to the 1930s, the old-growth forests of West Virginia were completely cut down. No more trees meant no more logging or logging town. The mills closed, the towns and narrow-gauge rail line were abandoned, and the metal section of the bridge was recycled for use during World War II.

After World War II, the U.S. Army's 1428th Engineer Float Bridge Company established Camp Prince, or Army Camp as it was known locally. The camp served as training and testing grounds for the quick assembly of floating bridges. These bridges were used for stream crossings of military equipment and personnel. There were usually between 100 to 150 soldiers stationed here at any one time. Each training session in the assembly of these bridges took approximately 6 to 8 weeks to complete. Temporary bridge building came to an end in 1957, and the camp closed for good in the early 1960s. Army Camp lies in the middle of New River Gorge National River, on the tip of one of the sharpest meanders in the park where the river flows west, north, and east, all within a distance of a half mile.

The New River was designated an American Heritage River on July 30, 1998. There are currently 14 American Heritage Rivers in the country (USDI-NPS, 2011d).

Environment

The New River begins in North Carolina and winds northward through southern West Virginia for nearly 320 miles. It traverses areas of diverse topography and spectacular scenery.

The New River was the main headwaters of an ancient watercourse called the Teays River, which flowed west to an immense inland sea that covered the central part of North America millions of years ago. Because the New River existed before the Appalachian Mountains, it was able to cut into these mountains as fast as they were

Figure 2.—Looking east at the New River Gorge from an overlook at Grandview State Park. The V-shaped valley was created by the downcutting of the river's waters through the Mississippian-age Bluestone and Hinton Formations.

uplifted. This very old river maintained its ancient course. The New River is the only river that cuts through the ridge and valley province of the Appalachian Mountains instead of draining from or around them. As it formed the gorge, the river sliced into and through thick coal-bearing rocks, exposing them (USDI-NPS, 2011c).

The V-shaped canyon of the New River is an outstanding natural feature of West Virginia (fig. 2). It was caused by erosion over a very long period of time, forming cliffs and canyon walls. The ongoing effects of erosion are visible in the large rocks and slides that have tumbled from the cliffs and into the river.

New River Gorge National River lies at the core of the largest remaining block of continuous, mid-latitude forest in the world. The gorge section of the park supports the most diverse plant assemblage of any river gorge in the central and southern Appalachians. This is due, in part, to the moisture gradient extremes that exist between the rim and river. The park provides critical habitat for abundant and diverse populations of migratory birds.

Also located in the park is the rare Appalachian Flatrock plant community, which includes sedges, cedars, and pines (fig. 3). This plant assemblage occurs on flat sandstone ledges along the New River and is dependent on the scouring caused by occasional flooding for its long-term integrity.

A wide variety of animals live in and around New River Gorge National River. The New River has long served as a migration corridor. Approximately 65 species of mammals are known to use the New River Gorge area. Common mammals include groundhog, raccoon, opossum, gray squirrel, fox squirrel, chipmunk, and white-tailed deer. Black bears, bobcats, coyotes, red foxes, and gray foxes are other species that may be encountered in the forest and along the riverbanks. Beaver, mink, and river otter can also be seen along the river (fig. 4).

The diverse forest and river ecosystems protected in the park provide critical habitat for a number of threatened and endangered species. The park contains relatively stable and healthy populations of Allegheny wood rats, a species of special concern in West Virginia. Twelve species of bats have been documented in the park, including two federally endangered species (Virginia big-eared bat and Indiana bat) and two State rare species (eastern big-eared bat and small-footed myotis). Abandoned mine portals, which occur throughout the park, provide habitat for roosting and hibernating.

Every year many species of birds migrate to, and through, New River Gorge National River in search of food and nesting sites. As part of a globally significant forest, the New River Gorge offers the food, water, shelter, and space these neo-tropical migrants require for survival.

Continuous forest, abandoned mine portals, rivers, and streams provide habitat for a diverse and nationally significant variety of amphibians and reptiles. Nearly 50

Figure 3.—The Appalachian Flatrock plant community.

Figure 4.—Evidence of beaver activity along the New River.

species of amphibians and 40 species of reptiles have been documented at New River Gorge National River (figs. 5 and 6).

Climate

Weather in the New River Gorge area is seasonal, and the climate generally mild. In winter, snowfall can be significant but is usually of short duration. Summers can be warm and humid.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from the first-order station at Beckley, West Virginia. This survey contains data from three weather stations in West Virginia: Oak Hill, the VA Hospital at Beckley, and Bluestone Lake (near Hinton). The data from Oak Hill and Beckley represent conditions in the upland areas. The data from Bluestone Lake represent conditions on the flood plains and footslopes of the New River Gorge.

Tables 1A through 1C provide temperature and precipitation data for the survey area for the period from 1971 to 2000. In the uplands, the average winter temperature is 32.8 degrees F (0.3 degree C) at Oak Hill and 32.5 degrees (0.4 degree C) at Beckley. The average daily minimum temperature is 23.2 degrees F (-4.9 degrees C) at Oak Hill and 22.2 degrees F (-5.4 degrees C) at Beckley. The lowest temperature on record, which occurred at Beckley on January 19, 1994, is -20 degrees F (-30.6 degrees C). In summer, the average temperature is 69.3 degrees F (20.7 degrees C) at Oak Hill and 67.3 degrees F (19.6 degrees C) at Beckley. The average daily maximum temperature is 80.5 degrees F (26.9 degrees C) at Oak Hill and 78.2 degrees F (25.7 degrees C) at Beckley. The highest temperature, which occurred at Beckley on July 15, 1954, is 99 degrees F (37.2 degrees C).

Figure 5.—The northern black racer snake (*Coluber constrictor constrictor*), a commonly seen reptile in the park.

Figure 6.—The common snapping turtle (*Chelydra serpentine*), another commonly observed reptile in the park.

In areas of the flood plains and footslopes, the average winter temperature is 33.8 degrees F (1.0 degree C). The average daily minimum temperature is 24.3 degrees F (-4.3 degrees C). The lowest temperature on record, which occurred on January 21, 1985, is -17 degrees F (-27.2 degrees C). In summer, the average temperature is 71.7 degrees F (22.1 degrees C). The average daily maximum temperature is 82.7 degrees (28.2 degrees C). The highest temperature, which occurred on August 29, 1948, is 103 degrees F (39.4 degrees C).

Tables 2A through 2C show probable dates of the first freeze in fall and the last freeze in spring. **Tables 3A through 3C** provide data on the length of the growing season. In the uplands, the average annual total precipitation is 46.15 inches (1172.2 millimeters) at Oak Hill and 39.54 inches (1004.3 millimeters) at Beckley. At Oak Hill, 24.7 inches (627.8 millimeters), or about 54 percent of the average, usually falls in May through October. At Beckley, 18.9 inches (480.6 millimeters), or about 48 percent of the average, usually falls in May through September. The growing season for most crops falls within the stated period. The heaviest 1-day rainfall during the period of record was 4.0 inches (101.6 millimeters) at Oak Hill, recorded on September 2, 1950, and 5.3 inches (134.9 millimeters) at Beckley, recorded on July 27, 2001.

In areas of the flood plains and footslopes, the average annual total precipitation is 37.77 inches (959.4 millimeters). Of this, 23.52 inches (597.4 millimeters), or about 62 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 3.94 inches (100.1 millimeters) at Bluestone Lake, recorded on August 20, 1969.

In the uplands, the average seasonal snowfall is 43.5 inches (1104.9 millimeters) at Oak Hill and 35.4 inches (899.2 millimeters) at Beckley. The greatest snow depth at any one time during the period of record was 24 inches (609.6 millimeters) at Oak Hill, recorded on March 14, 1994, and 28 inches (711.2 millimeters) at Beckley, recorded on January 28, 1998. On an average, the number of days per year that have at least 1 inch (25 millimeters) of snow on the ground is 38 at Oak Hill and 29 at Beckley. At Oak Hill, the heaviest 1-day snowfall on record was 19.0 inches (482.6 millimeters), recorded on January 7, 1996. At Beckley, it was 28.2 inches (716.3 millimeters) on January 7, 1996.

In areas of the flood plains and footslopes, the average seasonal snowfall is 21.2 inches (538.5 millimeters). The greatest snow depth at any one time during the period of record was 23 inches (584.2 millimeters), recorded on January 8, 1996. On an average, 20 days per year have at least 1 inch (25 millimeters) of snow on the ground. The heaviest 1-day snowfall on record was 16.0 inches, recorded on January 7, 1996.

The average relative humidity in mid-afternoon is about 61 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 56 percent of the time in summer and 35 percent in winter. The prevailing wind is from the southeast. Average windspeed is highest, 9.6 miles per hour (15.4 kilometers per hour), in March.

All climate data used in this report was obtained from the NRCS National Water and Climate Center (http://www.wcc.nrcs.usda.gov/).

How This Survey Was Made

This survey was made in conjunction with the National Park Service's Soil Inventory and Monitoring Program to provide information about the soils and miscellaneous areas within New River Gorge National River. A scoping meeting was held in 2006 with park staff to identify their soil resource information needs and to relate those needs to the existing soil survey. Of particular importance to park staff was information regarding management of the land for recreation, forest health, historical significance, wildlife, and watersheds.

The soil survey area of New River Gorge National River was established in 2011 and was part of two existing soil surveys: the Soil Survey of Fayette and Raleigh

Counties, West Virginia (USDA-NRCS, 2010b) and the Soil Survey of Mercer and Summers Counties, West Virginia (USDA-NRCS, 2007). This soil survey was initiated in 2006. Fieldwork for the project commenced in 2007 and ended in 2010 and concentrated on the areas of concern for the park staff.

During the soil survey, soil component relationships were observed, and soil-site correlation concepts were established to help in designing the map units. Soil and plant specialists tested the concepts during mapping and collected field documentation at numerous points across the landscape.

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 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, soils 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, they 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.

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 applied knowledge of soil-landscape relationships and used remote-sensing tools, including slope analysis and three-dimensional modeling, to delineate the boundaries of these bodies on digital imagery and identify each as a specific map unit.

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.

1. Clifftop-Nallen-Dekalb

Gently sloping to steep, well drained soils that formed in acid residuum derived from materials weathered from the New River Formation of the Pottsville Group

In this map unit, the landscape is characterized by the gently sloping to steep, linear to convex summits and shoulder slopes on the dissected Allegheny Plateau and on the margins of the New River Gorge and its tributaries. It is underlain by interbedded layers of acid sandstone, siltstone, and shale members of the New River Formation. The soils are acid and have low natural fertility. Slopes range from 3 to 35 percent.

This map unit makes up about 16 percent of the survey area. It is about 42 percent Clifftop soils, 33 percent Nallen soils, 8 percent Dekalb soils, and 17 percent soils and miscellaneous areas of minor extent.

The Clifftop soils are moderately deep, well drained, and gently sloping to steep. They formed in acid residuum derived mainly from interbedded shale, siltstone, and fine grained sandstone. The soils occur on convex summits, shoulder slopes, and backslopes. They have a brown, medium textured surface layer and a yellowish brown, medium textured, well developed subsoil which has been enriched with translocated clay and has a relatively low rock fragment content. Weathered bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches).

The Nallen soils are moderately deep, well drained, and gently sloping to moderately steep. They formed in residuum derived mainly from acid sandstone. The soils occur on convex summits. They have a very dark grayish brown, medium textured surface horizon and a yellowish brown, medium to coarse textured, moderately well developed subsoil which has been slightly enriched with translocated clay and has a relatively low rock fragment content. Hard bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches).

The Dekalb soils are moderately deep, well drained, and gently sloping to steep. They formed in residuum derived mainly from acid sandstone that is resistant to weathering. The soils are on convex summits and shoulder slopes. They are commonly associated with outcrops of sandstone bedrock. They have a thin, black, coarse textured surface horizon that has a high organic matter content and a dark yellowish brown to olive brown, coarse textured subsoil that is weakly developed and has a relatively high rock fragment content. Hard bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches). Because of the coarse textures and high rock fragment content, these soils have a low water-holding capacity.

The minor components of this map unit include Cookport and Fenwick soils. The deep, moderately well drained Cookport soils are on broad, gently sloping summits. The moderately deep, moderately well drained Fenwick soils are on strongly sloping summits. Also included are miscellaneous areas of Rock outcrop, which are mostly associated with the Dekalb soils, and commonly occur on shoulder slopes.

Most of this map unit is forested. A few areas have been cleared and are used for agriculture or housing or are idle. The main limitations of the soils are slope and depth to bedrock. Some gently sloping areas of Clifftop and Nallen soils are classified as prime farmland.

2. Layland-Dekalb-Laidig

Gently sloping to very steep, well drained soils that formed in colluvium and residuum derived from materials weathered mainly from the New River and Pocahontas Formations of the Pottsville Group

In this map unit, the landscape is characterized by the very steep, rugged backslopes of the New River Gorge and the very steep backslopes and gently sloping to steep footslopes of the surrounding dissected plateau and mountains. Stones and boulders are common and cover up to 50 percent of the soil surface in many areas. Rock outcrops of sandstone are a prominent feature in the New River Gorge. The soils are acid and have low natural fertility. Slopes range from 3 to 35 percent on the footslopes and up to 80 percent on the very steep backslopes in the New River Gorge.

This map unit makes up about 42 percent of the survey area. It is about 45 percent Layland soils, 23 percent Dekalb soils, 13 percent Laidig soils, and 19 percent soils and miscellaneous areas of minor extent.

The Layland soils are very deep, well drained, and moderately steep to very steep. They formed in acid colluvium derived mainly from interbedded sandstone, shale, and siltstone. The soils are on linear to concave portions of backslopes and footslopes. They have a very dark grayish brown to brown, medium textured surface layer and a yellowish brown, medium textured subsoil which is weakly developed. The soils have a high content of sandstone stones, cobbles, and channers, which generally increase in amount as depth increases.

The Dekalb soils are moderately deep, well drained, and very steep. They formed in residuum derived mainly from acid sandstone that is resistant to weathering. The soils are on convex portions of backslopes and are commonly associated with outcrops of sandstone bedrock. They have low natural fertility. They have a thin, black, coarse textured surface horizon that has a high organic matter content and a dark yellowish brown to olive brown, coarse textured subsoil that is weakly developed and has a relatively high rock fragment content. Hard bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches). Because of the coarse textures and high rock fragment content, these soils have a low water-holding capacity.

The Laidig soils are very deep, well drained, and gently sloping to steep. They formed in acid colluvium derived mainly from interbedded sandstone, shale, and siltstone. The soils are on linear to concave benches and footslopes. They have a very dark grayish brown, medium textured surface layer and a yellowish brown, medium textured, well developed subsoil that has been enriched with translocated clay. In the lower part of the subsoil, below a depth of 76 centimeters (30 inches), the Laidig soils have a very firm and dense layer called a fragipan. This layer is slowly permeable and restricts the passage of plant roots and water through the soil profile.

The minor components of this map unit include Guyandotte, Cotaco, Knowlton, Pope, Philo, and Atkins soils. The very deep, well drained Guyandotte soils are in north-facing mountain coves. The very deep, moderately well drained Cotaco soils and the very deep, poorly drained Knowlton soils are on old stream terraces. The very deep, well drained Pope soils, the very deep, moderately well drained Philo soils, and the very deep, poorly drained Atkins soils are on flood plains. Also included are miscellaneous areas of Rock outcrop that form cliffs in the New River Gorge. Atkins and Knowlton soils are hydric and support wetlands where they are not artificially drained. Areas of Cotaco, Pope, and Philo soils are classified as prime farmland.

Almost all of this map unit is forested. The main limitations of the soils for most uses are slope, a high slippage potential, depth to bedrock in areas of the Dekalb soils, stony surfaces, and the restricted permeability in areas of the Laidig soils.

3. Gilpin-Berks-Highsplint

Gently sloping to very steep, well drained soils that formed in acid residuum and colluvium derived mainly from materials weathered from the Bluestone and Princeton Formations of the Mauch Chunk Group

In this map unit, the landscape is characterized by the very steep backslopes of the New River Gorge and gently sloping to steep summits and structural benches which are underlain by interbedded layers of siltstone, shale, and sandstone. Stones cover up to 15 percent of the soil surface on the steeper slopes. The soils have medium natural fertility. Slopes range from 3 to 90 percent but are dominantly more than 15 percent.

This map unit makes up about 6 percent of the survey area. It is about 56 percent Gilpin soils, 17 percent Berks soils, 11 percent Highsplint soils, and 16 percent soils of minor extent.

The Gilpin soils are moderately deep, well drained, and gently sloping to very steep. They formed in acid residuum derived mainly from interbedded shale and siltstone. The soils are on convex summits, structural benches, and linear to convex portions of backslopes. They have a thin, very dark grayish brown to dark yellowish brown, medium textured surface layer and a yellowish brown to strong brown, medium textured, well developed subsoil that has been enriched with translocated clay. Moderately hard bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches).

The Berks soils are moderately deep, well drained, and steep or very steep. They formed in residuum derived from interbedded, weather-resistant shale, siltstone, and sandstone. The soils are on convex portions of very steep backslopes. They have a thin, dark brown to dark yellowish brown, medium textured surface horizon and a yellowish brown, medium textured subsoil that is weakly developed and has a relatively high rock fragment content. Hard bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches). Because of the high rock fragment content, these soils have a low water-holding capacity.

The Highsplint soils are very deep, well drained, and very steep. They formed in colluvium derived from interbedded shale, siltstone, and sandstone. The soils are on linear to concave portions of very steep backslopes. They have a very dark grayish brown to dark yellowish brown, medium textured surface horizon and a yellowish brown to dark yellowish brown, medium textured subsoil that is weakly developed and has a relatively high rock fragment content.

The minor components of this map unit include the moderately deep, well drained Lily soils. These soils are underlain by sandstone and are on structural benches and summits.

Most of the steeper areas of this map unit are forested. Some of the less sloping areas have been cleared and are used for agriculture. Gently sloping areas of the Gilpin and minor Lily soils are classified as prime farmland. The main limitations of the soils in this map unit are slope, a high slippage potential, and depth to bedrock in areas of the Gilpin and Berks soils.

4. Pipestem-Cateache

Gently sloping to very steep, well drained soils that formed in colluvium and residuum derived mainly from materials weathered from the Hinton and Bluefield Formations of the Mauch Chunk Group

In this map unit, the landscape is characterized by the very steep lower backslopes of the New River Gorge, steep coves, and strongly sloping to steep structural benches and footslopes that are underlain by interbedded layers of sandstone, siltstone, shale, and limestone. Stones cover up to 15 percent of the soil surface. The soils have high natural fertility. Slopes range from 3 to 80 percent.

This map unit makes up about 27 percent of the survey area. It is about 45 percent Pipestem soils, 38 percent Cateache soils, and 17 percent soils of minor extent.

The Pipestem soils are very deep, well drained, and gently sloping to very steep. They formed in colluvium derived mainly from interbedded sandstone, shale, siltstone, and limestone. The soils have high natural fertility. They are on linear to concave portions of backslopes and on footslopes. They have a dark brown, medium textured surface horizon and a reddish brown, fine textured subsoil that is weakly developed. Because of the high clay content in the subsoil, these soils are very susceptible to slippage, especially on steep slopes.

The Cateache soils are moderately deep, well drained, and strongly sloping to very steep. They formed in residuum derived mainly from interbedded shale, siltstone, and limestone. The soils have high natural fertility. They are on linear to convex portions of backslopes and on structural benches. They have a thin, dark brown, medium textured surface layer and a dark reddish brown, medium to fine textured, well developed subsoil that has been enriched with translocated clay. Soft reddish brown bedrock is at a depth of 51 to 102 centimeters (20 to 40 inches).

The minor components of this map unit all occur as inclusions (unnamed minor components) in the detailed soil map units. Also included in this unit are small areas of Rock outcrop.

All of this map unit is forested. The main limitations of the soils are slope, a high slippage potential, and depth to bedrock in areas of the Cateache soils.

5. Potomac-Craigsville-Combs

Nearly level and gently sloping, well drained and somewhat excessively drained soils that formed in alluvium washed from a mixture of upland soils

In this map unit, the landscape is characterized by the narrow flood plains along the swift-flowing New River and its tributaries. Cobbles and stones are common along the streams and in old stream channels. The alluvial parent materials that form the soils in this map unit have been washed from a wide variety of upland soils, both acid and nonacid. Some areas of this map unit classify as prime farmland. Slopes range from 0 to 5 percent.

This map unit makes up about 3 percent of the survey area. It is about 22 percent Potomac soils, 18 percent Craigsville soils, 16 percent Combs soils, and 44 percent soils and miscellaneous areas of minor extent.

The Potomac soils are very deep, somewhat excessively drained, and nearly level or gently sloping. They are on flood plains that are adjacent to rapids and shoals in the New River and are subject to frequent to occasional flooding. The soils formed in coarse textured, nonacid alluvium with a high rock fragment content. They have medium natural fertility. They have a dark brown, coarse textured surface horizon and a dark brown to brown, coarse textured substratum that is weakly developed. Because of the coarse textures and high rock fragment content, these soils have a low water-holding capacity, which limits their productivity.

The Craigsville soils are very deep, well drained, and nearly level or gently sloping. They are mainly at the mouths of tributaries of the New River. The soils are subject to rare flooding. They formed in medium to coarse textured, acid alluvium that has a high rock fragment content. The alluvium has mainly been washed from upland soils that formed in materials weathered from bedrock of the Pottsville Group. The soils have low natural fertility. They have a very dark brown, medium textured surface horizon, a dark brown to brown medium textured subsoil that is weakly developed, and a strong brown, coarse textured substratum. Because of the relatively coarse textures and high rock fragment content, these soils have a low water-holding capacity, which limits their productivity.

The Combs soils are very deep, well drained, and nearly level. They are mainly on flood plains that are adjacent to pools in the New River and are subject to occasional flooding. The soils formed in medium to coarse textured, nonacid alluvium. They have high natural fertility. They have a thick, brown to dark grayish brown, medium textured surface horizon and a brown to dark yellowish brown, medium to coarse textured subsoil that is weakly developed and has a relatively low rock fragment content.

The minor components of this map unit include Nelse soils, Chavies soils, and Lithic Hapludolls. The very deep, well drained Nelse soils occur with the Potomac soils on low flood plains. The very deep, well drained Chavies soils occur on high flood plains that have a rare flooding frequency. The shallow, somewhat excessively drained Lithic Hapludolls are limited to a small area near Sandstone Falls. Also included are small areas of Riverwash and Rock outcrop, which support little or no vegetation, and Water (the New River and large tributaries).

Most of this map unit is forested. A few areas are cleared and used for housing, recreation, vacation homes, or agriculture. All areas of the minor Chavies soils and some areas of the Combs soils are classified as prime farmland. Areas of Lithic Hapludolls support a unique ecosystem (Appalachian Riverside Flatrock Community). The main limitation of the soils in this map unit for most uses is flooding.

6. Kaymine-Udorthents-Cedarcreek

Nearly level to very steep, anthropogenic soils derived from human-transported materials (HTM)

In this map unit, the landscape has been drastically disturbed by humans. The unit includes contour surface mines, mountaintop surface mines, road and railroad grades and right-of-ways, and other areas where the soils and/or underlying bedrock have been excavated or placed as fill material. The parent materials of the soils in this unit are highly variable and may consist of one or a combination of any of the following materials: excavated native soils, overburden from the surface mining of coal, coal mining waste from underground mines, and excavated bedrock. The soils are young and have not been subjected to the soil-forming processes long enough for distinctive horizons to form in the subsoil. Slopes range from 0 to 70 percent.

This map unit makes up about 6 percent of the survey area. It is about 32 percent Kaymine soils, 31 percent Udorthents, 15 percent Cedarcreek soils, and 22 percent soils and miscellaneous areas of minor extent.

The Kaymine soils are very deep and well drained. They are on nearly level to strongly sloping benches and steep or very steep outslope areas of mountaintop and contour surface coal mines. The soils formed in nonacid regolith from the surface mining of coal. The regolith is a mixture of partially weathered fine earth and bedrock fragments. Rock fragments consist mainly of siltstone and sandstone with small amounts of shale and coal. The soils have medium natural fertility. They have a very dark grayish brown, medium textured surface horizon and a dark grayish brown, medium textured substratum. They have a high rock fragment content. In areas where modern reclamation practices have been used, these soils are commonly highly compacted.

The Udorthents are in areas that have been disturbed by excavation, grading, filling, or a combination of these activities. They are used for building sites, road beds, railroad grades, and parking lots. The parent material is highly variable but commonly consists of a mixture of native soils and excavated bedrock from local sources. The soils are generally well drained, are deep or very deep to bedrock, and have a high rock fragment content. They are commonly highly compacted by earth-moving machinery.

The Cedarcreek soils are very deep and well drained. They are on nearly level to strongly sloping benches and steep or very steep outslope areas of mountaintop and contour surface coal mines. The soils formed in acid regolith from the surface mining of coal. The regolith is a mixture of partially weathered fine earth and bedrock fragments. Rock fragments consist mainly of acid sandstone and siltstone with small amounts of shale and coal. The soils have low natural fertility. They have a very dark grayish brown, medium textured surface horizon and a dark grayish brown, medium textured substratum. They have a high rock fragment content. In areas where modern reclamation practices have been used, these soils are often highly compacted.

The minor components of this map unit include Lithic Udorthents and Itmann soils. The shallow Lithic Udorthents are generally less than 51 centimeters deep to bedrock and occur in areas that have been excavated (cut) for the construction of roads and railroads. The very deep, somewhat excessively drained Itmann soils formed in a regolith of waste materials from underground coal mines. Also included are areas of Rock outcrop, quarries, and Urban land. The rock outcrops have been exposed by excavation from the highwalls of old contour surface mines and can be observed in road cuts. The Urban land is any area that has been paved or is otherwise impervious to water.

Many areas of the Kaymine and Cedarcreek soils on the older contour surface mines are naturally reforested or have been planted in trees. Areas of these soils on reclaimed surface mines support grasses, legumes, and tree seedlings commonly used in the reclamation process. Some areas of the Udorthents along railroads and roads are kept barren by the application of herbicides. Many areas of these soils support non-native plant species. Because the properties of these soils are so variable, an onsite investigation is required to determine the suitability of any area for use and management.

Detailed Soil Map Units

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

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

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given 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, Atkins loam, 0 to 3 percent slopes, frequently flooded, is a phase of the Atkins series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Clifftop-Nallen complex, 3 to 8 percent slopes, is an example.

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

Table 4 gives the acres, hectares, and proportionate extent of each map unit in the park. 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.

AtA—Atkins loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 7)
Elevation: 550 to 801 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Atkins and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Atkins Soil

Soil Classification
Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Setting
Landform: Flood plains in mountain valleys
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Acid loamy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Poorly drained

Figure 7.—A typical landscape of Atkins loam, 0 to 3 percent slopes, frequently flooded. Atkins soils are poorly drained and formed in alluvium washed from upland acid sandstone and shale.

Flooding frequency: Frequent (see table 24)
Ponding frequency: Frequent (see table 24)
Depth to seasonal water table: At the soil surface (see table 24)
Available water capacity (entire profile): Very high (about 24.0 centimeters)

Interpretive Groups

Land capability subclass (nonirrigated areas): 5w
West Virginia grassland suitability group (WVGSG): Wetlands (W3)
Dominant vegetation map class(es):
Beaver-influenced Wetland
Hydric soil status: Yes
Hydrologic soil group: D

Representative Profile

Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 5 centimeters; moderately decomposed plant material
A—5 to 13 centimeters; loam
AB—13 to 20 centimeters; loam
Bg—20 to 66 centimeters; loam
BCg—66 to 97 centimeters; silty clay loam
Cg—97 to 165 centimeters; clay loam

Minor Components

Knowlton soils

Percent of map unit: 10 percent
Slope: 0 to 3 percent

Landform: Rarely flooded, low stream terraces in mountain valleys
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Hydric soil status: Yes

Philo soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: Flood plains
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Successional Eastern White Pine Forest
Hydric soil status: No

Morehead soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Low stream terraces
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Successional Eastern White Pine Forest
Hydric soil status: No

CaC—Cateache channery silt loam, 8 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 8)
Elevation: 393 to 766 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Cateache and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Cateache Soil

Soil Classification
Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Setting
Landform: Ridges and structural benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Nonacid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock

Figure 8.—A wooded area of Cateache channery silt loam, 8 to 15 percent slopes. Cateache soils are well suited for tree production.

Shrink-swell potential: Low (about 2.4 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.4 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 3e
West Virginia grassland suitability group (WVGSG): Limy Uplands (LU2)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Developed Area
Disturbed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 9 centimeters; channery silt loam
Bt1—9 to 75 centimeters; channery silty clay loam

Bt2—75 to 92 centimeters; channery silty clay loam
Cr—92 to 102 centimeters; bedrock

Minor Components

Pipestem soils
Percent of map unit: 15 percent
Slope: 8 to 15 percent
Landform: Mountain slopes
Hydric soil status: No

Berks soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Ridges and structural benches
Hydric soil status: No

Macove soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Colluvium-mantled mountain slopes
Hydric soil status: No

CbD—Cateache channery silt loam, 15 to 25 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 391 to 799 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Cateache and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Cateache Soil

Soil Classification
Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Setting
Landform: Ridges and structural benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 25 percent
Parent material: Nonacid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.4 LEP)

Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.4 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 9 centimeters; channery silt loam
Bt1—9 to 75 centimeters; channery silty clay loam
Bt2—75 to 92 centimeters; channery silty clay loam
Cr—92 to 102 centimeters; bedrock

Minor Components

Pipestem soils
Percent of map unit: 15 percent
Slope: 15 to 25 percent
Landform: Mountain slopes
Hydric soil status: No

Berks soils
Percent of map unit: 5 percent
Slope: 15 to 25 percent
Landform: Ridges and structural benches
Hydric soil status: No

Macove soils
Percent of map unit: 5 percent
Slope: 15 to 25 percent
Landform: Colluvium-mantled mountain slopes
Hydric soil status: No

CbE—Cateache channery silt loam, 25 to 35 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 379 to 940 meters

Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Cateache and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Cateache Soil

Soil Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 25 to 35 percent
Parent material: Nonacid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities

Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.4 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties

Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.6 centimeters)

Interpretive Groups

Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Successional Tulip Tree Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile

Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 9 centimeters; channery silt loam
Bt1—9 to 75 centimeters; channery silty clay loam
Bt2—75 to 92 centimeters; channery silty clay loam
Cr—92 to 102 centimeters; bedrock

Minor Components

Pipestem soils
Percent of map unit: 15 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Berks soils
Percent of map unit: 5 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Macove soils
Percent of map unit: 5 percent
Slope: 25 to 35 percent
Landform: Colluvium-mantled mountain slopes
Hydric soil status: No

CcG—Cateache-Pipestem complex, 35 to 80 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 9)
Elevation: 316 to 939 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Cateache and similar soils: 40 percent
Pipestem and similar soils: 40 percent
Dissimilar minor components: 20 percent

Description of the Cateache Soil

Soil Classification
Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 80 percent
Parent material: Nonacid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.4 LEP)
Salinity maximum based on representative value: Nonsaline

Figure 9.—A wooded area of Cateache–Pipestem complex, 35 to 80 percent slopes, very stony. Areas of this map unit are prone to landslides on steep slopes due to low soil strength.

Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.6 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
A—0 to 8 centimeters; channery silt loam
Bt1—8 to 74 centimeters; channery silty clay loam
Bt2—74 to 91 centimeters; channery silty clay loam
Cr—91 to 101 centimeters; bedrock

Description of the Pipestem Soil

Soil Classification
Fine, mixed, active, mesic Dystric Eutrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 80 percent
Parent material: Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 28.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 11 centimeters; channery silty clay loam
BA+Bw—11 to 137 centimeters; stony silty clay loam
BC—137 to 200 centimeters; very stony silty clay loam

Minor Components

Hustontown soils
Percent of map unit: 7 percent
Slope: 15 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Highsplint soils
Percent of map unit: 7 percent
Slope: 35 to 80 percent
Landform: Mountain slopes
Hydric soil status: No

Laidig soils
Percent of map unit: 3 percent

Slope: 35 to 55 percent
Landform: Drainageways and footslopes on mountain slopes
Dominant vegetation map class(es):
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

Rock outcrop
Percent of map unit: 3 percent
Landform: Sandstone outcrops on mountain slopes
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

CfC—Cedarcreek very channery loam, 0 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Surface mine on mountains
Elevation: 620 to 790 meters
Mean annual precipitation: 901 to 1,055 millimeters
Mean annual air temperature: 4 to 17 degrees C
Frost-free period: 119 to 162 days

Map Unit Composition

Cedarcreek and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Cedarcreek Soil

Soil Classification
Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents

Setting
Landform: Surface mine on mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.9 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Strip Mine Reclamation
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 10 centimeters; very channery loam
AC—10 to 25 centimeters; very channery loam
C—25 to 165 centimeters; extremely channery loam

Minor Components

Kaymine soils
Percent of map unit: 10 percent
Slope: 0 to 15 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

Sewell soils
Percent of map unit: 10 percent
Slope: 0 to 15 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

Cedarcreek, wet substratum soils
Percent of map unit: 4 percent
Slope: 0 to 5 percent
Note: These Cedarcreek soils are typically on benches on surface mines; they are typically nearly level or gently sloping and linear to concave in shape; they form a closed depression in some areas
Landform: Surface mine on mountain slopes
Hydric soil status: No

Rock outcrop
Percent of map unit: 1 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

CgF—Cedarcreek-Rock outcrop complex, very steep, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Contour surface mine on mountains
Elevation: 592 to 813 meters
Mean annual precipitation: 901 to 1,055 millimeters
Mean annual air temperature: 4 to 17 degrees C
Frost-free period: 119 to 162 days

Map Unit Composition

Cedarcreek, outslope and similar soils: 40 percent
Cedarcreek, bench and similar soils: 35 percent

Rock outcrop, highwall: 10 percent
Dissimilar minor components: 15 percent

Description of the Cedarcreek, Outslope Soil

Soil Classification
Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents

General

This Cedarcreek soil is on the outslope of contour surface mines. The outslope was formed when materials excavated to expose a coal seam along the contour of a mountain slope were pushed or dumped downslope from the mining bench. The outslope area is moderately steep to very steep, and the slope shape is typically linear to convex.

Setting
Landform: Outslope area on contour surface mine on mountain slopes
Aspect range: All aspects
Slope range: 25 to 60 percent
Parent material: Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.9 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Pine Plantation
Strip Mine Reclamation
Oak - Hickory Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 10 centimeters; very channery loam
AC—10 to 25 centimeters; very channery loam
C—25 to 165 centimeters; extremely channery loam

Description of the Cedarcreek, Bench Soil

Soil Classification
Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents

General

This Cedarcreek soil is on the bench of contour surface mines. The bench was formed when materials were excavated to expose a coal seam along the contour of a mountain slope. In some areas the benches were partially backfilled and graded. The bench area is nearly level to rolling, and the slope shape is typically linear or undulating.

Setting

Landform: Bench area on contour surface mine on mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock

Properties and Qualities

Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties

Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.9 centimeters)

Interpretive Groups

Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Pine Plantation
Oak - Hickory Forest
Strip Mine Reclamation
Hydric soil status: No
Hydrologic soil group: C

Representative Profile

Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 10 centimeters; very channery loam
AC—10 to 25 centimeters; very channery loam
C—25 to 165 centimeters; extremely channery loam

Description of Rock Outcrop, Highwall

Setting

The Rock outcrop in this map unit consists of bedrock exposed during the surface mining of coal and left exposed as a “highwall.” Highwalls were formed when materials were excavated to expose a coal seam along the contour of a mountain slope. These highwalls are vertical or nearly vertical and rise 10 to 60 feet above the bench floor.

Setting

Landform: Highwall of contour surface mine on mountain slopes
Aspect (representative): South

Aspect range: All aspects
Type of bedrock: Acid interbedded sedimentary rock

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Strip Mine Reclamation

Minor Components

Kaymine, outslope soils
Percent of map unit: 10 percent
Slope: 0 to 80 percent
Landform: Outslope area on contour surface mine on mountain slopes
Hydric soil status: No

Cedarcreek, wet substratum soils
Percent of map unit: 5 percent
Slope: 0 to 5 percent
Note: These Cedarcreek soils are on the bench of contour surface mines; the bench was formed when materials were excavated to expose a coal seam along the contour of a mountain slope; in some areas the benches were partially backfilled and graded; these soils are typically nearly level or gently sloping and linear to concave in shape; they commonly occur on the posterior portion of the mine bench near the highwall; in some areas they form a closed depression
Landform: Bench area on contour surface mine on mountain slopes
Hydric soil status: No

ChA—Chavies fine sandy loam, 0 to 3 percent slopes, rarely flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 311 to 419 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Chavies and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Chavies Soil

Soil Classification
Coarse-loamy, mixed, active, mesic Ultic Hapludalfs

Setting
Landform: Flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear
Across-slope shape: Linear

Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Coarse-loamy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: Rare (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 24.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 1
West Virginia grassland suitability group (WVGSG): Fertile Loams (FL2)
Dominant vegetation map class(es):
Developed Area
Sugar Maple - Yellow Buckeye - American Basswood Forest
Sycamore - Ash Floodplain Forest
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 28 centimeters; fine sandy loam
Bt+BC—28 to 107 centimeters; fine sandy loam
C—107 to 165 centimeters; sandy loam

Minor Components

Potomac soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Kanawha soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Flood plains in river valleys and low terraces
Hydric soil status: No

Middlebury soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Hustontown soils
Percent of map unit: 3 percent

Slope: 3 to 8 percent
Landform: Mountain slopes
Hydric soil status: No

Pipestem soils
Percent of map unit: 2 percent
Slope: 3 to 15 percent
Landform: Mountain slopes
Hydric soil status: No

CIE—Clifftop channery silt loam, 25 to 35 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 357 to 945 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Clifftop and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Clifftop Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Setting
Landform: Convex mountain slopes
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 25 to 35 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 13.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6e

West Virginia grassland suitability group (WVGSG): Acid Hills (AH3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Successional Tulip Tree Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 8 centimeters; channery silt loam
BA—8 to 20 centimeters; silt loam
Bt—20 to 74 centimeters; channery silty clay loam
BC—74 to 89 centimeters; very channery silty clay loam
Cr—89 to 99 centimeters; bedrock

Minor Components

Nallen soils
Percent of map unit: 15 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Dekalb soils
Percent of map unit: 10 percent
Slope: 25 to 45 percent
Landform: Mountain slopes
Hydric soil status: No

Layland soils
Percent of map unit: 5 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

CnB—Clifftop-Nallen complex, 3 to 8 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 505 to 950 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Clifftop and similar soils: 55 percent
Nallen and similar soils: 30 percent
Dissimilar minor components: 15 percent

Description of the Clifftop Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 13.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 8 centimeters; channery silt loam
BA—8 to 20 centimeters; silt loam
Bt—20 to 74 centimeters; channery silty clay loam
BC—74 to 91 centimeters; very channery silty clay loam
Cr—91 to 101 centimeters; bedrock

Description of the Nallen Soil

Soil Classification
Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest

Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Acid coarse-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 4 centimeters; moderately decomposed plant material
A—4 to 13 centimeters; loam
BA—13 to 23 centimeters; loam
Bt—23 to 48 centimeters; loam
BC+C—48 to 86 centimeters; channery sandy loam
R—86 to 96 centimeters; bedrock

Minor Components

Dekalb soils
Percent of map unit: 10 percent
Slope: 3 to 15 percent
Landform: Ridges
Hydric soil status: No

Cookport soils
Percent of map unit: 3 percent
Slope: 3 to 8 percent
Landform: Broad ridges
Hydric soil status: No

Fenwick soils
Percent of map unit: 2 percent
Slope: 3 to 8 percent
Landform: Broad ridges
Hydric soil status: No

CnC—Clifftop-Nallen complex, 8 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 384 to 968 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Clifftop and similar soils: 50 percent
Nallen and similar soils: 35 percent
Dissimilar minor components: 15 percent

Description of the Clifftop Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 13.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 3e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
- Oak - Hickory Forest
- Oak - Hickory - Sugar Maple Forest
- Developed Area

Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 8 centimeters; channery silt loam
BA—8 to 20 centimeters; silt loam
Bt—20 to 74 centimeters; channery silty clay loam
BC—74 to 91 centimeters; very channery silty clay loam
Cr—91 to 101 centimeters; bedrock

Description of the Nallen Soil

Soil Classification
Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Acid coarse-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 3e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 4 centimeters; moderately decomposed plant material
A—4 to 13 centimeters; loam
BA—13 to 23 centimeters; loam
Bt—23 to 48 centimeters; loam
BC+C—48 to 86 centimeters; channery sandy loam
R—86 to 96 centimeters; bedrock

Minor Components

Dekalb soils
Percent of map unit: 10 percent
Slope: 8 to 25 percent
Landform: Ridges
Hydric soil status: No

Fenwick soils
Percent of map unit: 3 percent
Slope: 8 to 15 percent
Landform: Ridges
Hydric soil status: No

Cookport soils
Percent of map unit: 2 percent
Slope: 3 to 8 percent
Landform: Ridges
Hydric soil status: No

CnD—Clifftop-Nallen complex, 15 to 25 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 359 to 947 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Clifftop and similar soils: 55 percent
Nallen and similar soils: 25 percent
Dissimilar minor components: 20 percent

Description of the Clifftop Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 25 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 13.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak / Ericad Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 8 centimeters; channery silt loam
BA—8 to 20 centimeters; silt loam
Bt—20 to 74 centimeters; channery silty clay loam
BC—74 to 91 centimeters; very channery silty clay loam
Cr—91 to 101 centimeters; bedrock

Description of the Nallen Soil

Soil Classification
Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 25 percent
Parent material: Acid coarse-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak / Ericad Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 4 centimeters; moderately decomposed plant material
A—4 to 13 centimeters; loam
BA—13 to 23 centimeters; loam
Bt—23 to 48 centimeters; loam
BC+C—48 to 86 centimeters; channery sandy loam
R—86 to 96 centimeters; bedrock

Minor Components

Dekalb soils
Percent of map unit: 10 percent
Slope: 15 to 25 percent
Landform: Ridges
Hydric soil status: No

Laidig soils
Percent of map unit: 5 percent
Slope: 15 to 35 percent
Landform: Footslopes of mountain slopes
Dominant vegetation map class(es):
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

Layland soils
Percent of map unit: 5 percent
Slope: 15 to 25 percent
Landform: Mountain slopes
Hydric soil status: No

CoA—Combs fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 302 to 411 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Combs and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Combs Soil

Soil Classification
Coarse-loamy, mixed, active, mesic Fluventic Hapludolls

Setting
Landform: Flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Recent coarse-loamy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: Occasional (see table 24)
Ponding frequency: None
Depth to seasonal water table: About 107 to 183 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 32.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2w
West Virginia grassland suitability group (WVGSG): Moist Loams (ML2)
Dominant vegetation map class(es):
  Sycamore - Ash Floodplain Forest
  Developed area
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
A—0 to 25 centimeters; fine sandy loam
Bw—25 to 122 centimeters; fine sandy loam
C—122 to 200 centimeters; cobbly sandy loam

Minor Components

Middlebury soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Grigsby soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Figure 10.—A landscape of Combs-Potomac complex, 0 to 3 percent slopes, very stony, occasionally flooded. Most of the woody debris, in the background, was deposited by the New River during spring flooding.

Yeager soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Flood plains in river valleys
Hydric soil status: No

CpA—Combs-Potomac complex, 0 to 3 percent slopes, very stony, occasionally flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 10)
Elevation: 250 to 411 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Combs and similar soils: 45 percent
Potomac and similar soils: 35 percent
Dissimilar minor components: 20 percent

Description of the Combs Soil

Soil Classification
Coarse-loamy, mixed, active, mesic Fluventic Hapludolls

Setting
Landform: High-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser and tread
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Nonacid coarse-loamy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: Occasional (see table 24)
Ponding frequency: None
Depth to seasonal water table: About 107 to 183 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 32.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4s
West Virginia grassland suitability group (WVGSG): Moist Loams (ML2)
Dominant vegetation map class(es):
Sycamore - Ash Floodplain Forest
Steep Riparian Edge
Developed Area
Disturbed Area
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
A—0 to 25 centimeters; fine sandy loam
Bw—25 to 122 centimeters; fine sandy loam
C—122 to 200 centimeters; cobbly sandy loam

Description of the Potomac Soil

Soil Classification
Sandy-skeletal, mixed, mesic Typic Udifluvents

Setting
Landform: High-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser and tread
Down-slope shape: Linear

Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Skeletal, nonacid sandy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Somewhat excessively drained
Flooding frequency: Occasional (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4s
West Virginia grassland suitability group (WVGSG): Sands (SA3)
Dominant vegetation map class(es):
Sycamore - Ash Floodplain Forest
Steep Riparian Edge
Developed Area
Disturbed Area
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 20 centimeters; gravelly sandy loam
C—20 to 200 centimeters; very gravelly loamy sand

Minor Components

Nelse soils
Percent of map unit: 8 percent
Slope: 0 to 5 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Yeager soils
Percent of map unit: 7 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Middlebury soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Figure 11.—A hayfield in an area of Cookport–Nallen complex, 3 to 8 percent slopes. Areas of this map unit qualify as prime farmland. (Image is from Raleigh County, West Virginia.)

CrB—Cookport-Nallen complex, 3 to 8 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 11)
Elevation: 509 to 966 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Cookport and similar soils: 50 percent
Nallen and similar soils: 35 percent
Dissimilar minor components: 15 percent

Description of the Cookport Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Aquic Fragiudults

Setting
Landform: Broad ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop and interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest

Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Fine-loamy residuum weathered from sandstone and shale

Properties and Qualities
Depth to restrictive feature: 41 to 76 centimeters to fragipan; 102 to 183 centimeters to lithic bedrock
Shrink-swell potential: Low (about 1.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Moderately well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table (depth, kind): About 36 to 63 centimeters; perched (see table 24)
Available water capacity (entire profile): Very high (about 14.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Hydric soil status: No
Hydrologic soil group: D

Representative Profile
Oe—0 to 3 centimeters; moderately decomposed plant material
A—3 to 8 centimeters; loam
BA—8 to 23 centimeters; loam
Bt—23 to 56 centimeters; loam
Btx—56 to 107 centimeters; loam
C—107 to 124 centimeters; sandy loam
R—124 to 134 centimeters; bedrock

Description of the Nallen Soil

Soil Classification
Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Broad ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop and interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Acid coarse-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)

Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 4 centimeters; moderately decomposed plant material
A—4 to 13 centimeters; loam
BA—13 to 23 centimeters; loam
Bt—23 to 48 centimeters; loam
BC+C—48 to 86 centimeters; channery sandy loam
R—86 to 96 centimeters; bedrock

Minor Components

Clifftop soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Broad ridges
Hydric soil status: No

Fenwick soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Broad ridges
Hydric soil status: No

Laidig soils
Percent of map unit: 3 percent
Slope: 3 to 15 percent
Landform: Footslopes and drainageways of mountain slopes
Dominant vegetation map class(es):
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

Dekalb soils
Percent of map unit: 2 percent
Slope: 3 to 15 percent
Landform: Broad ridges
Hydric soil status: No

CtB—Cotaco loam, 3 to 8 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 553 to 768 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Cotaco and similar soils: 75 percent
Dissimilar minor components: 25 percent

Description of the Cotaco Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Aquic Hapludults

Setting
Landform: Low stream terraces in mountain valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Old loamy alluvium derived from sandstone and shale
Vegetation: Eastern white pine and American cranberrybush

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: None
Ponding frequency: None
Depth to seasonal water table: About 46 to 76 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 34.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
  Oak - Hickory Forest
  Oak / Ericad Forest
  Disturbed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 4 centimeters; slightly decomposed plant material
Oe—4 to 6 centimeters; moderately decomposed plant material
A—6 to 23 centimeters; loam
BA—23 to 30 centimeters; loam
Bt1—30 to 53 centimeters; clay loam
Bt2+Bt3—53 to 93 centimeters; loam
BC—93 to 123 centimeters; clay loam
Cg—123 to 200 centimeters; clay loam

Minor Components

Clifftop soils
Percent of map unit: 8 percent
Slope: 8 to 15 percent
Landform: Ridges
Hydric soil status: No

Knowlton soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Rarely flooded, low stream terraces in mountain valleys
Hydric soil status: Yes

Monongahela soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

Morehead soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

Laidig soils
Percent of map unit: 2 percent
Slope: 3 to 15 percent
Landform: Footslopes of mountains
Dominant vegetation map class(es):
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

CxA—Craigsville very gravelly sandy loam, 0 to 5 percent slopes, extremely stony, rarely flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 12)
Elevation: 256 to 491 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Figure 12.—A wooded area of Craigsville very gravelly sandy loam, 0 to 5 percent slopes, extremely stony, rarely flooded, near the confluence of Glade Creek and the New River. Stones and boulders cover 3 to 15 percent of the surface.

Map Unit Composition

Craigsville and similar soils: 90 percent
Dissimilar minor components: 10 percent

Description of the Craigsville Soil

Soil Classification
Loamy-skeletal, mixed, superactive, mesic Fluventic Dystrudepts

Setting
Landform: Alluvial fans in river valleys and high-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear and convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 5 percent
Parent material: Skeletal loamy alluvium derived from sandstone and shale

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: Rare (see table 24)
Ponding frequency: None
Depth to seasonal water table: About 102 to 152 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 15.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Sycamore - Ash Floodplain Forest
Developed Area
Creek
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 5 centimeters; slightly decomposed plant material
Oe—5 to 8 centimeters; moderately decomposed plant material
A—8 to 21 centimeters; very gravelly sandy loam
Bw—21 to 60 centimeters; very gravelly sandy loam
C—60 to 200 centimeters; extremely gravelly loamy coarse sand

Minor Components

Pope soils
Percent of map unit: 6 percent
Slope: 0 to 3 percent
Landform: Alluvial fans in river valleys and high-energy flood plains in river valleys
Hydric soil status: No

Highsplint soils
Percent of map unit: 4 percent
Slope: 5 to 15 percent
Landform: Mountain slopes
Hydric soil status: No

DkC—Dekalb very channery loam, 3 to 15 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 558 to 649 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Dekalb and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Dekalb Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 15 percent
Parent material: Acid loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak / Ericad Forest
Cliff Top Virginia Pine Forest
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
Oe—1 to 3 centimeters; moderately decomposed plant material
A—3 to 8 centimeters; highly organic very channery sandy loam
BA—8 to 20 centimeters; very channery sandy loam
Bw—20 to 65 centimeters; very channery loam
BC—65 to 80 centimeters; extremely channery loam

Minor Components

Fenwick soils
Percent of map unit: 10 percent
Slope: 3 to 15 percent
Landform: Broad ridges
Hydric soil status: No

Figure 13.—Soil scientists collect soil samples on a typical landscape of Dekalb-Rock outcrop complex, 15 to 35 percent slopes, extremely stony. Rhododendron thickets and large sandstone stones are the dominant surface features in areas of this map unit. (Image is from Fayette County, West Virginia.)

Nallen soils
Percent of map unit: 10 percent
Slope: 3 to 15 percent
Landform: Ridges
Hydric soil status: No

DrE—Dekalb-Rock outcrop complex, 15 to 35 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 13)
Elevation: 323 to 953 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Dekalb and similar soils: 55 percent
Rock outcrop: 15 percent
Dissimilar minor components: 30 percent

Description of the Dekalb Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Upper third of mountain flank
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 35 percent
Parent material: Acid loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory Forest
Disturbed Area
Oak / Ericad Forest
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
Oe—1 to 3 centimeters; moderately decomposed plant material
A—3 to 8 centimeters; highly organic very channery sandy loam
BA—8 to 20 centimeters; very channery sandy loam
Bw—20 to 65 centimeters; very channery loam
BC—65 to 80 centimeters; extremely channery loam
R—80 to 90 centimeters; bedrock

Description of Rock Outcrop

Setting
Landform: Sandstone cliffs
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Mountain flank
Aspect (representative): Southwest

Aspect range: All aspects
Type of bedrock: Sandstone

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

Minor Components

Clifftop soils
Percent of map unit: 10 percent
Slope: 25 to 35 percent
Landform: Convex mountain slopes
Hydric soil status: No

Nallen soils
Percent of map unit: 10 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Layland soils
Percent of map unit: 5 percent
Slope: 15 to 35 percent
Landform: Areas below rock outcrops on mountain slopes
Hydric soil status: No

Totz soils
Percent of map unit: 5 percent
Slope: 3 to 25 percent
Landform: Areas near rock outcrops on mountain slopes
Dominant vegetation map class(es):
Cliff Top Virginia Pine Forest
Cliff Top Pitch Pine Woodland
Hydric soil status: No

GaB—Gilpin loam, 3 to 8 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 619 to 738 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Gilpin and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Gilpin Soil

Soil Classification
Fine-loamy, mixed, active, mesic Typic Hapludults

Setting
Landform: Structural benches and ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Upper third of mountain flank
Down-slope shape: Linear and convex
Across-slope shape: Linear and convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 11.5 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
Oe—1 to 2 centimeters; moderately decomposed plant material
A—2 to 16 centimeters; loam
BA—16 to 29 centimeters; channery silt loam
Bt—29 to 70 centimeters; channery silty clay loam
BC—70 to 76 centimeters; very channery silty clay loam
Cr—76 to 96 centimeters; bedrock

Minor Components

Lily soils
Percent of map unit: 15 percent
Slope: 3 to 8 percent
Landform: Ridges and structural benches
Hydric soil status: No

Cateache soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Structural benches and ridges
Hydric soil status: No

Figure 14.—Pasture and hayfield in an area of Gilpin loam, 8 to 15 percent slopes, in the Gilpin-Berks-Highsplint general soil map unit.

GaC—Gilpin loam, 8 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 14)
Elevation: 652 to 931 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Gilpin and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Gilpin Soil

Soil Classification
Fine-loamy, mixed, active, mesic Typic Hapludults

Setting
Landform: Structural benches and ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects

Slope range: 8 to 15 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 11.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 3e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Developed Area
Disturbed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 10 centimeters; loam
BA—10 to 32 centimeters; channery silt loam
Bt—32 to 63 centimeters; channery silty clay loam
BC—63 to 76 centimeters; very channery silty clay loam
Cr—76 to 96 centimeters; bedrock

Minor Components

Lily soils
Percent of map unit: 15 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

Berks soils
Percent of map unit: 10 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

Cateache soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

GaD—Gilpin loam, 15 to 25 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 583 to 834 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Gilpin and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Gilpin Soil

Soil Classification
Fine-loamy, mixed, active, mesic Typic Hapludults

Setting
Landform: Structural benches and ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 25 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 11.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
  Oak - Hickory Forest
  Disturbed Area
  Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material

A—2 to 8 centimeters; loam
BA—8 to 32 centimeters; channery silt loam
Bt—32 to 63 centimeters; channery silty clay loam
BC—63 to 76 centimeters; very channery silty clay loam
Cr—76 to 96 centimeters; bedrock

Minor Components

Lily soils
Percent of map unit: 15 percent
Slope: 15 to 25 percent
Landform: Structural benches and ridges
Hydric soil status: No

Berks soils
Percent of map unit: 10 percent
Slope: 15 to 25 percent
Landform: Structural benches and ridges
Hydric soil status: No

Cateache soils
Percent of map unit: 5 percent
Slope: 15 to 25 percent
Landform: Structural benches and mountain slopes
Hydric soil status: No

GbE—Gilpin-Berks complex, 25 to 35 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 529 to 1,004 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Gilpin and similar soils: 60 percent
Berks and similar soils: 20 percent
Dissimilar minor components: 20 percent

Description of the Gilpin Soil

Soil Classification
Fine-loamy, mixed, active, mesic Typic Hapludults

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder and backslope
Landform position (three-dimensional): Upper third of mountain flank
Down-slope shape: Linear and convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 25 to 35 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.9 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 8 centimeters; loam
BA—8 to 32 centimeters; channery silt loam
Bt—32 to 63 centimeters; channery silty clay loam
BC—63 to 76 centimeters; very channery silty clay loam
Cr—76 to 96 centimeters; bedrock

Description of the Berks Soil

Soil Classification
Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder and backslope
Landform position (three-dimensional): Upper third of mountain flank
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 25 to 35 percent
Parent material: Residuum weathered from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high

Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 7.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Dry Uplands (DU2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
A—3 to 13 centimeters; channery silt loam
BA—13 to 24 centimeters; channery silt loam
Bw—24 to 85 centimeters; very channery silt loam
C—85 to 94 centimeters; extremely channery silt loam
R—94 to 104 centimeters; bedrock

Minor Components

Lily soils
Percent of map unit: 15 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Cateache soils
Percent of map unit: 5 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

GhG—Gilpin-Highsplint-Berks complex, 35 to 90 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 15)
Elevation: 500 to 977 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Gilpin and similar soils: 45 percent
Highsplint and similar soils: 25 percent
Berks and similar soils: 20 percent
Dissimilar minor components: 10 percent

Figure 15.—A typical wooded landscape of Gilpin-Highsplint-Berks complex, 35 to 90 percent slopes, extremely stony. Oak, hickory, and sugar maple are the dominant tree species in areas of this map unit.

Description of the Gilpin Soil

Soil Classification
Fine-loamy, mixed, active, mesic Typic Hapludults

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 90 percent
Parent material: Acid fine-loamy residuum weathered from shale and siltstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to paralithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None

Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 9.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Oak - Hickory Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
A—0 to 5 centimeters; loam
BA—5 to 22 centimeters; channery silt loam
Bt—22 to 53 centimeters; channery silt loam
BC—53 to 66 centimeters; very channery silt loam
Cr—66 to 86 centimeters; bedrock

Description of the Highsplint Soil

Soil Classification
Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 90 percent
Parent material: Loamy-skeletal colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 16.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest

Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
Oe—2 to 4 centimeters; moderately decomposed plant material
A—4 to 22 centimeters; channery loam and very channery loam
BA—22 to 31 centimeters; very channery loam
Bw—31 to 120 centimeters; very channery loam
BC—120 to 140 centimeters; extremely channery loam
C—140 to 165 centimeters; extremely channery loam

Description of the Berks Soil

Soil Classification
Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 90 percent
Parent material: Residuum weathered from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 6.5 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak - Hickory - Sugar Maple Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
A—0 to 5 centimeters; channery silt loam
BA—5 to 16 centimeters; channery silt loam
Bw—16 to 77 centimeters; very channery silt loam
C—77 to 86 centimeters; extremely channery silt loam
R—86 to 96 centimeters; bedrock

Minor Components

Weikert soils
Percent of map unit: 6 percent
Slope: 35 to 90 percent
Landform: Mountain slopes
Hydric soil status: No

Laidig soils
Percent of map unit: 3 percent
Slope: 35 to 55 percent
Landform: Mountain slopes
Dominant vegetation map class(es):
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

Rock outcrop
Percent of map unit: 1 percent
Landform: Mountain slopes
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

HgE—Highsplint channery loam, 15 to 35 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 125—Cumberland Plateau and Mountains and 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 349 to 588 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 141 to 205 days

Map Unit Composition

Highsplint and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Highsplint Soil

Soil Classification
Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 35 percent
Parent material: Very stony colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters

Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 15.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
Oe—2 to 4 centimeters; moderately decomposed plant material
A—4 to 22 centimeters; channery loam and very channery loam
BA—22 to 31 centimeters; very channery loam
Bw—31 to 120 centimeters; very channery loam
BC—120 to 140 centimeters; extremely channery loam
C—140 to 165 centimeters; extremely channery loam

Minor Components

Laidig soils
Percent of map unit: 10 percent
Slope: 15 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Pineville soils
Percent of map unit: 10 percent
Slope: 15 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Berks soils
Percent of map unit: 5 percent
Slope: 15 to 35 percent
Landform: Convex mountain slopes
Hydric soil status: No

Gilpin soils
Percent of map unit: 3 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Cotaco soils
Percent of map unit: 2 percent

Slope: 8 to 15 percent
Landform: Remnant stream terraces in mountain valleys
Hydric soil status: No

ImC—Itmann very channery sandy loam, 0 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 575 to 595 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 140 to 190 days

Map Unit Composition

Itmann and similar soils: 100 percent

Description of the Itmann Soil

Soil Classification
Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents

Setting
Landform: Spoil piles on mountain slopes
Landform position (two-dimensional): Backslope and footslope
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Nonacid, carbonaceous, coal extraction mine spoil

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Somewhat excessively drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 14.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Disturbed Area

Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 9 centimeters; very channery sandy loam
C—9 to 165 centimeters; extremely channery sandy loam

ImF—Itmann very channery sandy loam, very steep

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 16)
Elevation: 548 to 592 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Itmann and similar soils: 100 percent

Description of the Itmann Soil

Soil Classification
Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents

Setting
Landform: Spoil piles on mountain slopes
Landform position (two-dimensional): Backslope and footslope
Landform position (three-dimensional): Mountain flank and mountain base
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 70 percent
Parent material: Non-acid, carbonaceous, coal extraction mine spoil

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Somewhat excessively drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 14.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)

Figure 16.—A typical landscape of Itmann very channery sandy loam, very steep. Itmann soils form in the acid regolith from deep-mined coal. Note the sparse "volunteer" vegetation. Areas such as this can be prime locations for the unwanted establishment of invasive species.

Dominant vegetation map class(es):
Disturbed Area
Sugar Maple - Yellow Buckeye - American Basswood Forest
Oak - Hickory - Sugar Maple Forest
Kudzu Patch
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 9 centimeters; very channery sandy loam
C—9 to 165 centimeters; extremely channery sandy loam

KmC—Kaymine very channery loam, 0 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Surface mine on mountains
Elevation: 284 to 867 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Kaymine and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Kaymine Soil

Soil Classification
Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents

Setting
Landform: Surface mine on mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 19.7 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Developed Area
Pine Plantation
Strip Mine Reclamation
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A+AC—1 to 33 centimeters; extremely channery loam
C—33 to 165 centimeters; extremely channery loam

Minor Components

Cedarcreek soils
Percent of map unit: 10 percent
Slope: 0 to 15 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

Fiveblock soils
Percent of map unit: 10 percent
Slope: 0 to 15 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

Kaymine, wet substratum soils
Percent of map unit: 5 percent
Slope: 0 to 5 percent
Note: These Kaymine soils typically occur on benches on surface mines; they are typically nearly level to gently sloping and linear to concave in shape; in some areas they form a closed depression
Landform: Surface mine on mountain slopes
Hydric soil status: No

Sewell soils
Percent of map unit: 4 percent
Slope: 0 to 15 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

Rock outcrop
Percent of map unit: 1 percent
Landform: Surface mine on mountain slopes
Hydric soil status: No

KrF—Kaymine-Rock outcrop complex, very steep, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Contour surface mine on mountains (fig. 17)
Elevation: 262 to 862 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Kaymine, outslope and similar soils: 40 percent
Kaymine, bench and similar soils: 35 percent
Rock outcrop, highwall: 10 percent
Dissimilar minor components: 15 percent

Description of the Kaymine, Outslope Soil

Soil Classification
Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents

Figure 17.—A landscape of Kaymine–Rock outcrop complex, very steep, very stony. After mining, this map unit is commonly reclaimed with grass species or pine plantations. As time passes, other native species may be introduced to the sites by wind and wild animals.

General

This Kaymine soil is on the outslope of contour surface mines. The outslope was formed when materials excavated to expose a coal seam along the contour of a mountain slope were pushed or dumped downslope from the mining bench. The outslope area is moderately steep to very steep, and the slope shape is typically linear to convex.

Setting

Landform: Outslope area on contour surface mine on mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 25 to 60 percent
Parent material: Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone

Properties and Qualities

Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties

Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained

Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 19.7 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Strip Mine Reclamation
  Pine Plantation
  Sugar Maple - Yellow Buckeye - American Basswood Forest
  Oak - Hickory Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A+AC—1 to 33 centimeters; extremely channery loam
C—33 to 165 centimeters; extremely channery loam

Description of the Kaymine, Bench Soil

Soil Classification
Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents

General

This Kaymine soil is on the bench of contour surface mines. The bench was formed when materials were excavated to expose a coal seam along the contour of a mountain slope. In some areas the benches were partially backfilled and graded. The bench area is nearly level to rolling, and the slope shape is typically linear or undulating.

Setting
Landform: Bench area on contour surface mine on mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 19.7 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s

West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Strip Mine Reclamation
Pine Plantation
Oak - Hickory Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A+AC—1 to 33 centimeters; extremely channery loam
C—33 to 165 centimeters; extremely channery loam

Description of Rock Outcrop

General

The Rock outcrop in this map unit consists of bedrock exposed during the surface mining of coal and left exposed as a "highwall." Highwalls were formed when materials were excavated to expose a coal seam along the contour of a mountain slope. These highwalls are vertical or nearly vertical and rise 10 to 60 feet above the bench floor.

Setting
Landform: Highwall of contour surface mine on mountain slopes
Aspect (representative): South
Aspect range: All aspects
Type of bedrock: Acid interbedded sedimentary rock

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Strip Mine Reclamation
Hydric soil status: No

Minor Components

Cedarcreek, outslope soils
Percent of map unit: 5 percent
Slope: 25 to 60 percent
Landform: Outslope area on contour surface mine on mountain slopes
Hydric soil status: No

Fiveblock, outslope soils
Percent of map unit: 5 percent
Slope: 25 to 60 percent
Landform: Outslope area on contour surface mine on mountain slopes
Hydric soil status: No

Kaymine, wet substratum soils
Percent of map unit: 5 percent
Slope: 0 to 5 percent
Note: These Kaymine soils occur on the bench of contour surface mines; the bench was formed when materials were excavated to expose a coal seam along the contour of a mountain slope; in some areas the benches were partially backfilled and graded; these soils are typically nearly level or gently sloping and linear to concave in shape; they commonly are on the posterior portion of the mine bench near the highwall; in some areas they form a closed depression

Landform: Bench area on contour surface mine on mountain slopes
Hydric soil status: No

KwA—Knowlton loam, 0 to 3 percent slopes, rarely flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 575 to 624 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Knowlton and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Knowlton Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Typic Endoaquults

Setting
Landform: Rarely flooded, low stream terraces in mountain valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Loamy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Poorly drained
Flooding frequency: Rare (see table 24)
Ponding frequency: None
Depth to seasonal water table: At the soil surface to 30 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 27.5 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 4w
West Virginia grassland suitability group (WVGSG): Wetlands (W2)
Dominant vegetation map class(es):
- Disturbed Area
- Oak - Hickory Forest
- Forest Seep

Hydric soil status: Yes
Hydrologic soil group: D

Representative Profile
Oe—0 to 2 centimeters; moderately decomposed plant material
A—2 to 25 centimeters; loam
BEg—25 to 43 centimeters; loam
Btg1—43 to 56 centimeters; loam
Btg2—56 to 165 centimeters; loam

Minor Components

Knowlton, nonflooded soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: Nonflooded, low stream terraces in mountain valleys
Hydric soil status: Yes

Morehead soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

Atkins soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Flood plains in mountain valleys
Hydric soil status: Yes

Cotaco soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

LaC—Laidig channery loam, 3 to 15 percent slopes, rubbly

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 473 to 962 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Laidig and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Laidig Soil

Soil Classification
Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear and concave
Across-slope shape: Concave and linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 15 percent
Parent material: Rubbly colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 76 to 127 centimeters to fragipan
Shrink-swell potential: Low (about 1.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table (depth, kind): About 76 to 117 centimeters; perched (see table 24)
Available water capacity (entire profile): Very high (about 23.4 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Disturbed Area
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Deciduous Tree / Great Laurel Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; stony slightly decomposed plant material
A—2 to 9 centimeters; gravelly highly organic loam
A/B—9 to 19 centimeters; gravelly loam
Bt1—19 to 80 centimeters; gravelly loam
Bt2—80 to 122 centimeters; gravelly loam
Btx—122 to 200 centimeters; gravelly loam

Minor Components

Layland soils
Percent of map unit: 13 percent
Slope: 15 to 35 percent
Landform: Areas below rock outcrops on mountain slopes
Hydric soil status: No

Atkins soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent

Landform: Flood plains in mountain valleys
Dominant vegetation map class(es):
Beaver-influenced Wetland
Hydric soil status: Yes

Philo soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Flood plains in mountain valleys
Hydric soil status: No

Pope soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Flood plains in mountain valleys
Hydric soil status: No

Rock outcrop
Percent of map unit: 2 percent
Landform: Mountain slopes
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

LeF—Layland-Dekalb-Guyandotte complex, 35 to 70 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 433 to 967 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Layland and similar soils: 45 percent
Dekalb and similar soils: 30 percent
Guyandotte and similar soils: 15 percent
Dissimilar minor components: 10 percent

Description of the Layland Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects

Slope range: 35 to 55 percent
Parent material: Extremely stony, acid colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 21.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory - Sugar Maple Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 5 centimeters; moderately decomposed plant material
A—5 to 15 centimeters; gravelly loam
BA—15 to 23 centimeters; gravelly loam
Bw—23 to 117 centimeters; very gravelly loam
BC—117 to 145 centimeters; very gravelly loam
C—145 to 200 centimeters; very gravelly loam

Description of the Dekalb Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Convex mountain slopes and ridges
Landform position (two-dimensional): Summit and backslope
Landform position (three-dimensional): Mountain flank, mountaintop, nose slope, and interfluve
Down-slope shape: Linear and convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 35 to 70 percent
Parent material: Acid loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline

Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.1 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak / Ericad Forest
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
Oe—1 to 3 centimeters; moderately decomposed plant material
A—3 to 8 centimeters; highly organic very channery sandy loam
BA—8 to 20 centimeters; very channery sandy loam
Bw—20 to 65 centimeters; very channery loam
BC—65 to 80 centimeters; extremely channery loam
R—80 to 90 centimeters; bedrock

Description of the Guyandotte Soil

Soil Classification
Loamy-skeletal, mixed, active, mesic Typic Humudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Upper third of mountain flank
Down-slope shape: Linear and concave
Across-slope shape: Concave
Aspect (representative): North
Aspect range: Northwest to east (clockwise)
Slope range: 35 to 55 percent
Parent material: Loamy-skeletal colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None

Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 17.9 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest
Deciduous Tree / Great Laurel Forest
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 31 centimeters; very gravelly loam
AB—31 to 46 centimeters; very gravelly loam
Bw—46 to 140 centimeters; very gravelly loam
C—140 to 200 centimeters; extremely gravelly loam

Minor Components

Clifftop soils
Percent of map unit: 9 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Rock outcrop
Percent of map unit: 1 percent
Landform: Mountain slopes
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

LgG—Layland-Dekalb-Rock outcrop complex, 55 to 80 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 18)
Elevation: 250 to 874 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Layland and similar soils: 45 percent
Dekalb and similar soils: 30 percent
Rock outcrop: 10 percent
Dissimilar minor components: 15 percent

Description of the Layland Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Figure 18.—An area of a Layland-Dekalb-Rock outcrop complex, 55 to 80 percent slopes, extremely stony. The extremely stony Layland soil is in the foreground, and the Rock outcrop is in the background.

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountain flank
Down-slope shape: Linear and concave
Across-slope shape: Linear and concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 55 to 80 percent
Parent material: Extremely stony, acid colluvium derived from interbedded sedimentary rock

Properties and Qualities

Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties

Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 21.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Oak - Hickory - Sugar Maple Forest
  Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 5 centimeters; moderately decomposed plant material
A—5 to 15 centimeters; gravelly loam
BA—15 to 23 centimeters; gravelly loam
Bw—23 to 117 centimeters; very gravelly loam
BC—117 to 145 centimeters; very gravelly loam
C—145 to 200 centimeters; very gravelly loam

Description of the Dekalb Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Convex mountain slopes
Landform position (two-dimensional): Shoulder and backslope
Landform position (three-dimensional): Mountain flank and nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 55 to 80 percent
Parent material: Acid loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): High
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Moderate (about 8.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Oak - Hickory Forest
  Oak / Ericad Forest
  Eastern Hemlock - Chestnut Oak / Catawba Rhododendron Forest

Hydric soil status: No
Hydrologic soil group: A

Representative Profile
A—0 to 5 centimeters; very channery highly organic sandy loam
BA—5 to 17 centimeters; very channery sandy loam
Bw—17 to 62 centimeters; very channery loam
BC—62 to 77 centimeters; extremely channery loam
R—77 to 87 centimeters; bedrock

Description of Rock Outcrop

Setting
Landform: Sandstone escarpments
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Upper third of mountain flank
Aspect (representative): South
Aspect range: All aspects
Type of bedrock: Sandstone

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Cliff

Minor Components

Guyandotte soils
Percent of map unit: 5 percent
Slope: 35 to 55 percent
Landform: North-facing mountain slopes
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest
Deciduous Tree / Great Laurel Forest
Hydric soil status: No

Laidig soils
Percent of map unit: 5 percent
Slope: 15 to 35 percent
Landform: Concave mountain slopes
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No

Clifftop soils
Percent of map unit: 4 percent
Slope: 25 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Totz soils
Percent of map unit: 1 percent
Slope: 3 to 25 percent
Landform: Areas near rock outcrops on mountain slopes
Dominant vegetation map class(es):
Cliff Top Virginia Pine Forest
Hydric soil status: No

LhE—Layland-Laidig complex, 15 to 35 percent slopes, rubbly

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 264 to 936 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Layland and similar soils: 60 percent
Laidig and similar soils: 25 percent
Dissimilar minor components: 15 percent

Description of the Layland Soil

Soil Classification
Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Backslope and footslope
Landform position (three-dimensional): Mountain base and mountain flank
Down-slope shape: Concave and linear
Across-slope shape: Linear, concave, and convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 35 percent
Parent material: Rubbly, acid colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 21.0 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; stony slightly decomposed plant material
Oe—3 to 5 centimeters; stony moderately decomposed plant material
A—5 to 15 centimeters; gravelly loam
BA—15 to 23 centimeters; gravelly loam
Bw—23 to 117 centimeters; very gravelly loam
BC—117 to 145 centimeters; very gravelly loam
C—145 to 200 centimeters; very gravelly loam

Description of the Laidig Soil

Soil Classification
Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountain base
Down-slope shape: Linear and concave
Across-slope shape: Concave and linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 35 percent
Parent material: Rubbly colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 76 to 127 centimeters to fragipan
Shrink-swell potential: Low (about 1.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately low
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table (depth, kind): About 76 to 117 centimeters; perched (see table 24)
Available water capacity (entire profile): Very high (about 23.4 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Sugar Maple - Yellow Buckeye - American Basswood Forest
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Deciduous Tree / Great Laurel Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 2 centimeters; stony slightly decomposed plant material
A—2 to 9 centimeters; gravelly highly organic loam
A/B—9 to 19 centimeters; gravelly loam

Bt1—19 to 80 centimeters; gravelly loam
Bt2—80 to 122 centimeters; gravelly loam
Btx—122 to 200 centimeters; gravelly loam

Minor Components

Dekalb soils
Percent of map unit: 10 percent
Slope: 35 to 70 percent
Landform: Mountain slopes
Dominant vegetation map class(es):
Oak / Ericad Forest
Hydric soil status: No

Philo soils
Percent of map unit: 3 percent
Slope: 0 to 3 percent
Landform: Flood plains in mountain valleys
Dominant vegetation map class(es):
Tributary Floodplain Forest
Hydric soil status: No

Rock outcrop
Percent of map unit: 2 percent
Landform: Sandstone outcrops on mountain slopes
Dominant vegetation map class(es):
Cliff
Hydric soil status: No

LIB—Lily loam, 3 to 8 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 658 to 800 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Lily and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Lily Soil

Soil Classification
Fine-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Ridges and structural benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear

Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 3 to 8 percent
Parent material: Acid fine-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.3 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
  Oak - Hickory Forest
  Developed Area
  Disturbed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
Oe—2 to 5 centimeters; moderately decomposed plant material
A—5 to 11 centimeters; loam
BA—11 to 19 centimeters; loam
Bt—19 to 78 centimeters; loam
C—78 to 90 centimeters; channery sandy loam
R—90 to 100 centimeters; bedrock

Minor Components

Gilpin soils
Percent of map unit: 20 percent
Slope: 3 to 8 percent
Landform: Structural benches and ridges
Hydric soil status: No

Berks soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

Fenwick soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Structural benches and broad ridges
Hydric soil status: No

LIC—Lily loam, 8 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 637 to 818 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Lily and similar soils: 70 percent
Dissimilar minor components: 30 percent

Description of the Lily Soil

Soil Classification
Fine-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Structural benches and ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Acid fine-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 12.3 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 3e
West Virginia grassland suitability group (WVGSG): Acid Loams (AL2)
Dominant vegetation map class(es):
Oak - Hickory Forest
Developed Area
Oak - Hickory - Sugar Maple Forest
Successional Tulip Tree Forest
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
Oe—2 to 5 centimeters; moderately decomposed plant material
A—5 to 11 centimeters; loam
BA—11 to 19 centimeters; loam
Bt—19 to 78 centimeters; loam
C—78 to 90 centimeters; channery sandy loam
R—90 to 100 centimeters; bedrock

Minor Components

Gilpin soils
Percent of map unit: 20 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

Berks soils
Percent of map unit: 10 percent
Slope: 8 to 15 percent
Landform: Structural benches and ridges
Hydric soil status: No

LrA—Lithic Hapludolls-Rock outcrop complex, 0 to 3 percent slopes, rubbly, rarely flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: River valleys (fig. 19)
Elevation: 393 to 397 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Lithic Hapludolls and similar soils: 80 percent
Rock outcrop: 20 percent

Description of the Lithic Hapludolls

Soil Classification
Loamy-skeletal, mixed, active, mesic Lithic Hapludolls

Setting
Landform: Rarely flooded strath terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): South
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Gravelly alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 25 to 51 centimeters to lithic bedrock
Shrink-swell potential: Low (about 1.5 LEP)

Figure 19.—A typical landscape of Lithic Hapludolls–Rock outcrop complex, 0 to 3 percent slopes, rubbly, rarely flooded, near Sandstone Falls. This map unit is the site for the Appalachian River Flatrock Community, a unique ecosystem community containing a rare assemblage of plants that grow in only a few places along the New River.

Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Somewhat excessively drained
Flooding frequency: Rare (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Low (about 4.9 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Eastern Red-cedar - Virginia Pine - Flatrock Woodland
Sycamore - Ash Floodplain Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
A1—0 to 20 centimeters; gravelly loam
A2—20 to 38 centimeters; very gravelly loam
C—38 to 46 centimeters; extremely gravelly loam
R—46 to 56 centimeters; bedrock

Description of Rock Outcrop

Setting
Landform: Rarely flooded strath terraces
Landform position (three-dimensional): Tread
Aspect (representative): South
Aspect range: All aspects
Type of bedrock: Sandstone

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Hydric soil status: No

LxG—Lithic Udorthents-Rock outcrop complex, cut land, 5 to 100 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 396 to 866 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Lithic Udorthents and similar soils: 50 percent
Rock outcrop: 40 percent
Dissimilar minor components: 10 percent

Description of the Lithic Udorthents

Soil Classification
Lithic Udorthents

General

These soils have been drastically disturbed by humans with the use of heavy machinery. They are in areas where the native soils and the underlying bedrock have been excavated (cut) for the construction of highways and railroads. The soils formed in materials weathered from the exposed bedrock and/or bedrock materials that have been crushed and worked by heavy machinery or have formed in the remnant substratum of the original native soil. They are typically less than 50 centimeters deep, are loamy in the fine-earth fraction, contain more than 35 percent rock fragments (by volume) and have a low water-holding capacity. Soil properties such as texture, bulk density, soil reaction (pH), and saturated hydraulic conductivity are highly variable. Because the soil properties are highly variable, an onsite investigation is required to determine the suitability of these soils for use and management.

Setting
Landform: Drastically disturbed areas on mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 5 to 100 percent

Parent material: Cut and fill materials derived from native soils and interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: 10 to 50 centimeters to lithic bedrock
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Natural drainage class: Somewhat excessively drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very low (about 1.5 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Developed Area
Hydric soil status: No
Hydrologic soil group: D

Representative Profile
A—0 to 10 centimeters; very gravelly loam
C—10 to 22 centimeters; extremely gravelly sandy loam
R—22 to 32 centimeters; bedrock

Description of Rock Outcrop

General

The Rock outcrop in this map unit consists of bedrock exposed along excavations made to create road beds.

Setting
Aspect (representative): South
Aspect range: All aspects
Type of bedrock: Interbedded sedimentary rock

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
Hydric soil status: No

Minor Components

Udorthents
Percent of map unit: 10 percent
Slope: 5 to 100 percent
Landform: Disturbed areas related to construction practices
Hydric soil status: No

NfC—Nallen-Fenwick complex, 8 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains

Elevation: 508 to 909 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Nallen and similar soils: 65 percent
Fenwick and similar soils: 15 percent
Dissimilar minor components: 20 percent

Description of the Nallen Soil

Soil Classification
Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Setting
Landform: Broad ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Acid coarse-loamy residuum weathered from sandstone

Properties and Qualities
Depth to restrictive feature: 51 to 102 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.1 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
  Oak - Hickory Forest
  Oak / Ericad Forest
  Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 4 centimeters; moderately decomposed plant material
A—4 to 13 centimeters; loam
BA—13 to 23 centimeters; loam
Bt—23 to 48 centimeters; loam

BC+C—48 to 86 centimeters; channery sandy loam
R—86 to 96 centimeters; bedrock

Description of the Fenwick Soil

Soil Classification
Fine-loamy, mixed, semiactive, mesic Aquic Hapludults

Setting
Landform: Broad ridges
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 8 to 15 percent
Parent material: Acid fine-loamy residuum weathered from sandstone and shale

Properties and Qualities
Depth to restrictive feature: 51 to 109 centimeters to lithic bedrock
Shrink-swell potential: Low (about 2.2 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table (depth, kind): About 41 to 91 centimeters; perched (see table 24)
Available water capacity (entire profile): Very high (about 12.7 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Acid Soils (RA3)
Dominant vegetation map class(es):
Oak - Hickory Forest
Oak / Ericad Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oe—0 to 3 centimeters; moderately decomposed plant material
A—3 to 8 centimeters; silt loam
AB—8 to 23 centimeters; silt loam
Bt—23 to 66 centimeters; loam
BC—66 to 86 centimeters; loam
C—86 to 99 centimeters; loam
R—99 to 109 centimeters; bedrock

Minor Components

Dekalb soils
Percent of map unit: 10 percent
Slope: 3 to 15 percent
Landform: Ridges
Hydric soil status: No

Clifftop soils
Percent of map unit: 5 percent
Slope: 8 to 15 percent
Landform: Ridges
Hydric soil status: No

Cookport soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Broad ridges
Hydric soil status: No

PhA—Philo-Pope complex, 0 to 3 percent slopes, occasionally flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 547 to 730 meters
Mean annual precipitation: 943 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 140 to 190 days

Map Unit Composition

Philo and simlar soils: 50 percent
Pope and similar soils: 30 percent
Dissimilar minor components: 20 percent

Description of the Philo Soil

Soil Classification
Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts

Setting
Landform: Flood plains in mountain valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountain base and base slope
Down-slope shape: Linear and convex
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Acid coarse-loamy alluvium derived from sandstone and shale

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Moderately well drained
Flooding frequency: Occasional (see table 24)
Ponding frequency: None

Depth to seasonal water table: About 46 to 91 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 18.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2w
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Oak - Hickory Forest
Deciduous Tree / Great Laurel Forest
Hydric soil status: No
Hydrologic soil group: C

Representative Profile
Oi—0 to 5 centimeters; slightly decomposed plant material
A—5 to 23 centimeters; loam
Bw—23 to 76 centimeters; loam
C+2C—76 to 165 centimeters; very gravelly sandy loam

Description of the Pope Soil

Soil Classification
Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts

Setting
Landform: Flood plains in mountain valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Mountain base and base slope
Down-slope shape: Linear and convex
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Acid coarse-loamy alluvium derived from sandstone and shale

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: Occasional (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 27.3 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 2w
West Virginia grassland suitability group (WVGSG): Acid Loams (AL3)
Dominant vegetation map class(es):
Eastern Hemlock - Sweet Birch - Tuliptree / Great Laurel Forest
Deciduous Tree / Great Laurel Forest
Oak - Hickory Forest

Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 3 centimeters; slightly decomposed plant material
Oe—3 to 5 centimeters; moderately decomposed plant material
A—5 to 18 centimeters; sandy loam
Bw—18 to 81 centimeters; sandy loam
C—81 to 200 centimeters; very gravelly sandy loam

Minor Components

Atkins soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: Flood plains in mountain valleys
Hydric soil status: Yes

Morehead soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

Cotaco soils
Percent of map unit: 5 percent
Slope: 3 to 8 percent
Landform: Low stream terraces in mountain valleys
Hydric soil status: No

PkC—Pipestem channery silty clay loam, 3 to 15 percent slopes, very stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 317 to 718 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Pipestem and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Pipestem Soil

Soil Classification
Fine, mixed, active, mesic Dystric Eutrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest

Aspect range: All aspects
Slope range: 3 to 15 percent
Parent material: Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 28.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 6s
West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest
Oak - Hickory - Sugar Maple Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 11 centimeters; channery silty clay loam
BA+Bw—11 to 137 centimeters; stony silty clay loam
BC—137 to 200 centimeters; very stony silty clay loam

Minor Components

Hustontown soils
Percent of map unit: 10 percent
Slope: 3 to 15 percent
Landform: Mountain slopes
Hydric soil status: No

Cateache soils
Percent of map unit: 5 percent
Slope: 3 to 15 percent
Landform: Mountain slopes
Hydric soil status: No

PmE—Pipestem channery silty clay loam, 15 to 35 percent slopes, extremely stony

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains

Elevation: 309 to 933 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 158 to 205 days

Map Unit Composition

Pipestem and similar soils: 80 percent
Dissimilar minor components: 20 percent

Description of the Pipestem Soil

Soil Classification
Fine, mixed, active, mesic Dystric Eutrudepts

Setting
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountain flank
Down-slope shape: Linear
Across-slope shape: Concave
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 35 percent
Parent material: Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 2.3 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): Very high (about 28.2 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 7s
West Virginia grassland suitability group (WVGSG): Very Rocky, Limy Soils (RL2)
Dominant vegetation map class(es):
Sugar Maple - Yellow Buckeye - American Basswood Forest
Oak - Hickory - Sugar Maple Forest
Developed Area
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
Oi—0 to 1 centimeter; slightly decomposed plant material
A—1 to 11 centimeters; channery silty clay loam
BA+Bw—11 to 137 centimeters; stony silty clay loam
BC—137 to 200 centimeters; very stony silty clay loam

Figure 20.—A typical landscape of Potomac–Nelse complex, 0 to 5 percent slopes, extremely stony, frequently flooded.

Minor Components

Cateache soils
Percent of map unit: 15 percent
Slope: 15 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

Hustontown soils
Percent of map unit: 5 percent
Slope: 15 to 35 percent
Landform: Mountain slopes
Hydric soil status: No

PxA—Potomac-Nelse complex, 0 to 5 percent slopes, extremely stony, frequently flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 20)
Elevation: 301 to 409 meters
Mean annual precipitation: 865 to 1,044 millimeters
Mean annual air temperature: 6 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Potomac and similar soils: 60 percent
Nelse and simlar soils: 20 percent
Dissimilar minor components: 20 percent

Description of the Potomac Soil

Soil Classification
Sandy-skeletal, mixed, mesic Typic Udifluvents

Setting
Landform: High-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 5 percent
Parent material: Skeletal, nonacid sandy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Somewhat excessively drained
Flooding frequency: Frequent (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters
Available water capacity (entire profile): High (about 10.8 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 5w
West Virginia grassland suitability group (WVGSG): Sands (SA3)
Dominant vegetation map class(es):
Sycamore - Ash Floodplain Forest
Developed Area
Sycamore - River Birch Riverscour Woodland
Steep Riparian Edge
Hydric soil status: No
Hydrologic soil group: A

Representative Profile
Oi—0 to 2 centimeters; slightly decomposed plant material
A—2 to 20 centimeters; gravelly sandy loam
C—20 to 200 centimeters; very gravelly loamy sand

Description of the Nelse Soil

Soil Classification
Sandy, mixed, active, nonacid mesic Mollic Udifluvents

Setting
Landform: High-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 5 percent
Parent material: Nonacid sandy alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Shrink-swell potential: Low (about 1.5 LEP)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Slowest capacity to transmit water (K_{sat}): Moderately high
Natural drainage class: Well drained
Flooding frequency: Frequent (see table 24)
Ponding frequency: None
Depth to seasonal water table: About 122 to 183 centimeters (see table 24)
Available water capacity (entire profile): Very high (about 18.7 centimeters)

Interpretive Groups
Land capability subclass (nonirrigated areas): 5w
West Virginia grassland suitability group (WVGSG): Moist Loams (ML3)
Dominant vegetation map class(es):
  Sycamore - Ash Floodplain Forest
  Developed Area
  Sycamore - River Birch Riverscour Woodland
  Steep Riparian Edge
Hydric soil status: No
Hydrologic soil group: B

Representative Profile
A1+A2—0 to 30 centimeters; sandy loam
C1+C2—30 to 74 centimeters; loamy sand
C3+C4—74 to 200 centimeters; sand

Minor Components

Yeager soils
Percent of map unit: 10 percent
Slope: 0 to 3 percent
Landform: Flood plains in river valleys
Hydric soil status: No

Riverwash
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: Areas along the rivers on high-energy flood plains in river valleys

Dominant vegetation map class(es):
American Water-willow Cobble Bar
Cobble
Riverscour Prairie
Hydric soil status: No

Lobdell soils
Percent of map unit: 5 percent
Slope: 0 to 3 percent
Landform: High-energy flood plains in river valleys
Hydric soil status: No

Qs—Quarry, sandstone

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Quarry on mountains
Elevation: 782 to 898 meters
Mean annual precipitation: 1,034 to 1,289 millimeters
Mean annual air temperature: 5 to 17 degrees C
Frost-free period: 141 to 190 days

Map Unit Composition

Quarry, sandstone: 100 percent

Description of Quarry, Sandstone

General

This map unit consists of areas of excavated sandstone boulders, stones, and gravel piles and the adjacent highwalls which were exposed during the mining process. These areas are no longer operational.

Setting
Landform: Mountain slopes
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 100 percent
Parent material: Acid sandstone

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters, except at highwall (where rock is at the surface)
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Strip Mine Reclamation
Hydric soil status: No

Figure 21.—An area of Riverwash, frequently flooded, along the New River. These sand and gravel bars are alluvial deposits in a river bed or flood channel and are subject to erosion and deposition during recurring flood periods. Most areas of Riverwash support little or no vegetation.

Rw—Riverwash, frequently flooded

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains (fig. 21)
Elevation: 260 to 401 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Riverwash: 95 percent
Dissimilar minor components: 5 percent

Description of Riverwash

General

Riverwash consists of unstabilized sandy, silty, gravelly, or cobbly sediments that are frequently flooded, washed, and reworked by the river. Most areas of Riverwash support little or no vegetation.

Setting

Landform: Areas along the rivers on high-energy flood plains in river valleys
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest

Aspect range: All aspects
Slope range: 0 to 3 percent
Parent material: Sandy and gravelly alluvium derived from interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Flooding frequency: Frequent (see table 24)
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters

Interpretive Groups
Land capability subclass (nonirrigated areas): 8w
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Sycamore - River Birch Riverscour Woodland
River
Cobble
American Water-willow Cobble Bar
Riverscour Prairie
Hydric soil status: No

Minor Components

Rubble land
Percent of map unit: 5 percent
Description: Boulder and stone rock topple deposits
Landform: Areas along the rivers
Hydric soil status: No

UgC—Udorthents, graded, 0 to 15 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 314 to 759 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Udorthents and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Udorthents

Soil Classification
Udorthents

General

These soils have been drastically disturbed by humans with the use of heavy machinery. They are typically in areas that have been filled and graded for road beds, building sites, parking areas, and river access areas. They are typically derived from a mixture of excavated and graded native soils and crushed bedrock. Construction materials, such as chunks of concrete, are part of the soil mixture in some areas. The soils are typically more than 150 centimeters deep, are loamy in the fine-earth fraction, and contain more than 35 percent rock fragments, by volume. Rock fragments in the soil profile consist of sandstone, siltstone, shale, coal, or limestone in various proportions. Soil properties such as texture, bulk density, soil reaction (pH), saturated hydraulic conductivity, and available water capacity are highly variable. Because the soil properties are highly variable, an onsite investigation is required to determine the suitability of these soils for use and management.

Setting
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 15 percent
Parent material: Cut and fill materials derived from native soils and interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters

Interpretive Groups
Land capability subclass (nonirrigated areas): 7e
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Developed Area
Disturbed Area
Railroad
Hydric soil status: No

Representative Profile
A—0 to 4 centimeters; very channery silt loam
AC—4 to 27 centimeters; very channery silt loam
C—27 to 165 centimeters; extremely channery silt loam

Minor Components

Lithic Udorthents
Percent of map unit: 5 percent
Slope: 0 to 15 percent
Landform: Drastically disturbed areas on mountain slopes
Hydric soil status: No

Rock outcrop
Percent of map unit: 5 percent
Landform: Areas of bedrock exposed during construction practices
Hydric soil status: No

Urban land
Percent of map unit: 5 percent
Slope: 0 to 15 percent
Landform: Areas that have been paved with asphalt or concrete and are impervious to water
Dominant vegetation map class(es):
Road
Hydric soil status: No

UgF—Udorthents, graded, 15 to 55 percent slopes

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 256 to 789 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Udorthents and similar soils: 85 percent
Dissimilar minor components: 15 percent

Description of the Udorthents

Soil Classification
Udorthents

General

These soils have been drastically disturbed by humans with the use of heavy machinery. They are typically in areas that have been filled and graded for road beds and building sites and in areas that have been disturbed for bridge construction. They are typically derived from a mixture of excavated and graded native soils and crushed bedrock. Construction materials, such as chunks of concrete, are part of the soil mixture in some areas. The soils are typically more than 150 centimeters deep, are loamy in the fine-earth fraction, and contain more than 35 percent rock fragments, by volume, throughout. Rock fragments in the soil profile consist of sandstone, siltstone, shale, coal, or limestone in various proportions. Soil properties such as texture, bulk density, soil reaction (pH), saturated hydraulic conductivity, and available water capacity are highly variable. Because the soil properties are highly variable, an onsite investigation is required to determine the suitability of these soils for use and management.

Setting
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 15 to 55 percent
Parent material: Cut and fill materials derived from native soils and interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum based on representative value: Nonsaline

Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters

Interpretive Groups
Land capability subclass (nonirrigated areas): 8e
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Developed Area
  Disturbed Area
Hydric soil status: No

Representative Profile
A—0 to 4 centimeters; very channery silt loam
AC—4 to 27 centimeters; very channery silt loam
C—27 to 165 centimeters; extremely channery silt loam

Minor Components

Lithic Udorthents
Percent of map unit: 10 percent
Slope: 15 to 55 percent
Landform: Drastically disturbed areas on mountain slopes
Hydric soil status: No

Rock outcrop
Percent of map unit: 5 percent
Landform: Areas of bedrock exposed during construction practices
Hydric soil status: No

Ur—Udorthents, railroad grade

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Elevation: 252 to 607 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Udorthents and similar soils: 93 percent
Dissimilar minor components: 7 percent

Description of the Udorthents

Soil Classification
Udorthents

General

These soils include the rail bed and the fill which was used to create the grade. The rail bed is nearly level and composed of crushed stone. The outslopes of the fill are typically steep or very steep. The soils on the outslopes are typically derived from a mixture of excavated and graded native soils and crushed bedrock. These soils are typically more than 150 centimeters deep and have more than 35 percent rock fragments throughout. Rock fragments in the soil profile consist of sandstone, siltstone, shale, coal, or limestone in various proportions. Soil properties such as texture, bulk density, soil reaction (pH), saturated hydraulic conductivity, and available water capacity are highly variable. Because the soil properties are highly variable, an onsite investigation is required to determine the suitability of these soils for use and management.

In areas where the rails are active and the rail grades are being maintained, growth of vegetation is suppressed with herbicides. Where the rails have been abandoned, the rail grades support a variety of trees, shrubs, grasses, herbs, and forbs. They also provide a media for the growth of invasive species.

Setting
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 70 percent
Parent material: Cut and fill materials derived from native soils and interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Natural drainage class: Excessively drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters

Interpretive Groups
Land capability subclass (nonirrigated areas): 8e
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
Railroad
Hydric soil status: No

Minor Components

Rock outcrop
Percent of map unit: 5 percent
Landform: Nearly vertical high walls, either natural or exposed during railway construction
Hydric soil status: No

Urban land
Percent of map unit: 1 percent
Landform: Areas that have been paved with asphalt or concrete and are impervious to water
Dominant vegetation map class(es):
Road
Hydric soil status: No

Endoaquepts
Percent of map unit: 1 percent
Slope: 0 to 3 percent
Landform: Closed depressions located behind the rail beds on mountain slopes
Hydric soil status: Yes

Uu—Udorthents-Urban land complex, highways

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 386 to 842 meters
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Udorthents and similar soils: 70 percent
Urban land: 25 percent
Dissimilar minor components: 5 percent

Description of the Udorthents

Soil Classification
Udorthents

General

These soils have been drastically disturbed by humans with the use of heavy machinery. They typically are in areas that have been filled and graded for road beds, along divided highways, such as U.S. Routes 19 and 64. They are typically derived from a mixture of excavated and graded native soils and crushed bedrock. They are typically more than 150 centimeters deep, are loamy in the fine-earth fraction, and have more than 35 percent rock fragments throughout. Rock fragments in the soil profile consist of sandstone, siltstone, shale, coal, or limestone in various proportions. Soil properties such as texture, bulk density, soil reaction (pH), saturated hydraulic conductivity, and available water capacity are highly variable. Because the soil properties are highly variable, an onsite investigation is required to determine the suitability of these soils for use and management.

Setting
Down-slope shape: Linear
Across-slope shape: Linear
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 7 percent
Parent material: Cut and fill materials derived from native soils and interbedded sedimentary rock

Properties and Qualities
Depth to restrictive feature: None within a depth of 150 centimeters
Salinity maximum based on representative value: Nonsaline
Sodicity maximum: Not sodic
Calcium carbonate equivalent percent: No carbonates

Hydrologic Properties
Natural drainage class: Well drained
Flooding frequency: None
Ponding frequency: None
Seasonal water table: None within a depth of 160 centimeters

Interpretive Groups
Land capability subclass (nonirrigated areas): 8e
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Developed Area
Hydric soil status: No

Representative Profile
A—0 to 4 centimeters; very channery silt loam
AC—4 to 27 centimeters; very channery silt loam
C—27 to 165 centimeters; extremely channery silt loam

Description of Urban Land

General

This map unit component consists of areas that have been paved with asphalt or concrete and are impervious to water.

Setting
Aspect (representative): Southwest
Aspect range: All aspects
Slope range: 0 to 7 percent

Interpretive Groups
Land capability subclass (nonirrigated areas): 8s
West Virginia grassland suitability group (WVGSG): Not Suited (NS)
Dominant vegetation map class(es):
  Road
Hydric soil status: No

Minor Components

Rock outcrop
Percent of map unit: 5 percent
Landform: Areas of bedrock exposed during construction practices
Hydric soil status: No

W—Water

Map Unit Setting

Major land resource area (MLRA): 127—Eastern Allegheny Plateau and Mountains
Landscape: Mountains
Elevation: 250 to 414 meters on the New River and its major tributaries
Mean annual precipitation: 865 to 1,346 millimeters
Mean annual air temperature: 5 to 18 degrees C
Frost-free period: 147 to 205 days

Map Unit Composition

Water: 98 percent
Dissimilar minor components: 2 percent

Description of Water

This map unit consists of the New River, its major tributaries, and a few ponds. Minimal interpretations are given.

Interpretive Groups

Dominant vegetation map class(es):
- River
- Pond
- Steep Riparian Edge
- Backwater Slough

Minor Components

Rubble land

Percent of map unit: 1 percent
Description: Boulder and stone rock topple deposits
Landform: Areas along the river
Hydric soil status: No

Riverwash

Percent of map unit: 1 percent
Slope: 0 to 3 percent
Landform: Areas along the rivers on high-energy flood plains in river valleys
Dominant vegetation map class(es):
- American Water-willow Cobble Bar
- Sycamore - River Birch Riverscour Woodland
- Riverscour Prairie
- Cobble

Hydric soil status: No

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in New River Gorge National River. 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 as rangeland and as sites for buildings, sanitary facilities, highways and other transportation systems, and recreational facilities. 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 park. 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, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the park for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, slightly limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately well suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. Generally, the limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

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 map units in the survey area 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 also are considered.

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

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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 rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA-SCS, 1961). Only class and subclass are used in this survey.

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

Class 1 soils have slight limitations that restrict their use.

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

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

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

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

The capability classification of map units in this park is given in the section “Detailed Soil Map Units” and in **table 5**.

Prime and Other Important Farmland

Table 6 lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, 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.

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

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Hydric Soils

Table 7 lists the map units that meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002). Hydric soils are defined and described below.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; 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, 2002). 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” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 2010) and in the “Soil Survey Manual” (Soil Survey Division Staff, 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-NRCS, 2010a).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Landscape, Parent Material, and West Virginia Grassland Suitability Class

Table 8 displays information about the relationships between soils and landscapes, landforms, parent materials, and the West Virginia grassland suitability class.

Percent of the map unit is the extent of the named soil in the map unit.

Slope is 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. The table shows the low and high range of slope for the named component or soil.

Elevation is the height of an object or area on the earth’s surface in reference to a fixed reference point, such as mean sea level. The typical low and high range of elevation is displayed for each soil.

MAP is the mean annual precipitation for areas of the soil in the map unit.

Landscape refers to the broad shape of the earth in the area where the soil occurs. Examples are a valley and a mountain.

Landform is a specific shape of the earth in the area where the soil typically occurs. Examples are a mountain summit and a valley bottom.

Parent material is the material in which soils formed. Examples are the underlying geological material (including bedrock), a surficial deposit (such as volcanic ash), and organic material. Soils inherit their chemical and physical properties from the parent material.

West Virginia grassland suitability class names and numbers indicate groupings of soils which have similar capabilities for growing adapted herbaceous species and have similar responses to management. These groupings, when combined with climate and aspect, reflect the productive potential of soils and provide a guide to conservation and management decisions when permanent grassland is the land use objective. More information about West Virginia grassland suitability classes can be found in **appendix 1**.

Vegetation Map Classes

Dominant vegetation map classes are assigned to components of soil map units and are listed in the map unit descriptions under the heading “Interpretive Groups.” The soil components are correlated with the vegetation map classes which are published in “Vegetation Classification and Mapping of New River Gorge National River, West Virginia” (Technical Report NPS/NER/NRTR 2007/092). A complete copy of the tehnical report is available on the Internet at: http://www.nps.gov/nero/science/FINAL/NERI_veg_map/NERI_veg_map.htm.

All major soil components and miscellaneous land types (such as Rock outcrop) are correlated to one or more vegetation map classes. Each vegetation map class that is listed in the map unit description provides coverage of at least 15 percent of the total acreage of the soil map unit. For soil complexes, different vegetation classes were often correlated with different soil components, in accordance with the data. In a few soil map units, components of minor extent are correlated with a vegetation map class if the data indicates the existence of a unique relationship.

The U.S. National Vegetation Classification (USNVC) was used as the standard for vegetation classification (see **table 9**). Map classes were also assigned to aquatic areas, disturbed areas, and cultural and transportation features.

The vegetation map (**appendix 2**) for New River Gorge National River includes 47 map classes, arranged in 7 categories: upland forests and woodlands, lichen and sparse vegetation (cliffs), riparian communities, headwater wetlands, aquatic features, cultural and disturbed areas, and transportation features.

Relationships between map classes and U.S. National Vegetation Classification (USNVC) associations are usually simple but can be complex. Map classes for natural vegetation are typically equivalent to single associations with names of the map classes corresponding to the community names listed in **table 9**. Extensive association-level map classes, however, may contain small inclusions of other associations, and the boundaries between these types are likely to be gradual rather than abrupt, as portrayed by the map. During the vegetation mapping phase, it was thought that some polygons of one association-level map class (Sugar Maple – Yellow Buckeye – American Basswood Forest) might have inclusions greater than the minimum mapping unit of the Successional Tuliptree / Northern Spicebush Forest association, which could not be delineated on aerial imagery due to heavy shading; however, during the accuracy assessment phase, no inclusions of Successional Tuliptree / Northern Spicebush Forest were encountered. One association (*Liriodendron tulipifera – Betula lenta – Tsuga canadensis / Rhododendron maximum* Forest [CEGL007543]) is divided between two map classes (Deciduous Tree / Great Laurel Forest *and* Eastern Hemlock – Sweet Birch – Tuliptree / Great Laurel Forest) based on presence or absence of *Tsuga Canadensis* (eastern hemlock).

Four vegetation complexes (Steep Riparian Edge; Beaver-influenced Wetland; Cliff; and Successional Tuliptree Forest) composed of multiple associations were mapped. Steep Riparian Edge is a diverse map class which occurs in a narrow strip along miles of shoreline of the New River. Polygons of Steep Riparian Edge may include small patches of up to 10 different associations and may also include disturbed areas (e.g., steep banks between a railroad and the river). Within the Steep Riparian Edge map class, boundaries between associations are commonly blurred due to tight compression of environmental gradients (i.e., flooding regime) across a narrow zone. The Beaver-influenced Wetland map class is composed of small intermingling patches of up to four shrub and herbaceous wetland associations and also includes areas of open water. The Cliff map class includes two associations which occur in small adjacent patches with distributions related to aspect and seepage. Polygons of the Successional Tuliptree Forest map class may include one or two associations which have distributions related to soil moisture and fertility. The initial USNVC associations designated for this map class were changed after an accuracy assessment but, in order not to invalidate the accuracy assessment, no attempt was made to attribute individual polygons to individual associations.

Small areas of unvegetated, natural riparian disturbance features (Cobble and Flatrock Pavement) were mapped which do not correspond to associations. Map classes for aquatic features, transportation features, disturbed areas, and most cultural areas do not correspond to, but may include, patches of associations. Two cultural vegetation types (Pine Plantation and Kudzu Patch) are mapped as associations. Many associations occur in more than one map class. Map classes in which each association is included are also listed in the key to vegetation types “Vegetation Classification and Mapping of New River Gorge National River, West Virginia.”

Forest Productivity

Table 10 can help forestland owners or managers plan the use of soils for wood crops. It shows the potential productivity of the soils for wood crops.

Potential productivity of *characteristic trees* on a soil is expressed as a site index and as a volume number. Characteristic trees and other typical plant species are listed by common name in **appendix 3** and by scientific name in **appendix 4**.

The *site index base age* indicates the age used for the site curves.

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. More detailed information regarding site index is available in the “National Forestry Manual,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Land Management

In **table 11, parts I through IV**, interpretive ratings are given for various aspects of land management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified land management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified land management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for *fire damage* and *seedling mortality* are expressed as low, moderate, and high. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

Rating class terms for *hazard for erosion* are expressed as slight, moderate, severe, and very severe. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for erosion is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for land management practices.

Part I (Planting)

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of planting equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Part II (Hazard of Erosion and Suitability for Roads)

Ratings in the column *hazard of erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in areas where 50 to 75 percent of the surface has been exposed by different kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Part III (Site Preparation)

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Part IV (Site Restoration)

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Recreation

The soils of the survey area are rated in **table 12, parts I and II**, according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in **table 12** can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Foot traffic and equestrian trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Mountain bike and off-road vehicle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, depth to a water table, ponding, slope, flooding, and texture of the surface layer.

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, landscaping, 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 between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for 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, ponds, 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.

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. **Table 13** shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Roads and Streets, Shallow Excavations, and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. **Table 14** shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Landscaping require soils on which turf, trees, and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sewage Disposal

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (K_{sat}), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (K_{sat}), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (K_{sat}) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a K_{sat} rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Source of Gravel and Sand

Table 16 gives information about the soils as potential sources of gravel and sand. Normal compaction, minor processing, and other standard construction practices are assumed.

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. Only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

Source of Reclamation Material, Roadfill, and Topsoil

Table 17 gives information about the soils as potential sources of reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. Numerical ratings between 0.00 and 0.99 are given after the specified features. These numbers indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation as a potential source.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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

Ponds and Embankments

Table 18 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of 5 or 6 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, K_{sat} of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained 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 particle-size distribution, plasticity, and compaction characteristics.

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

The estimates of soil properties are shown in tables. They include engineering properties, physical and chemical properties, and pertinent soil and water features.

Appendix 5 lists pedons that were analyzed by the Natural Resources Conservation Service, Kellogg Soil Survey Laboratory, Lincoln, Nebraska. This table provides the correlated name, pedon type, name the pedon was sampled as (if there was a name), user site ID, user pedon ID, lab source, and lab pedon number. The results of physical and chemical analyses are available on the Internet (http://ssldata.nrcs.usda.gov/querypage.asp).

Engineering Properties

Table 19 gives the engineering classifications and the range of engineering properties for the layers of each soil in the park.

Depth to the upper and lower boundaries of each layer is indicated.

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

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 250 millimeters in diameter and 75 to 250 millimeters in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical Soil Properties

Table 20 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the park. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller. If a range is not present, a singular representative value is shown.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (K_{sat}), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential of the soil to expand and contract with a loss or gain in moisture. Linear extensibility is used to determine the shrink-swell potential of soils. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

The shrink-swell potential is *low* if the soil has a linear extensibility of less than 3 percent; *moderate* if 3 to 6 percent; *high* if 6 to 9 percent; and *very high* if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion Properties

Table 21 shows estimates of some erosion factors that affect a soil's potential for different uses. These estimates are given for each layer of every soil for K factors and are given as one rating for the entire soil for the T factor. Values are reported for each soil in the park. Estimates are based on field observations and on test data for these and similar soils.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the

Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and K_{sat}. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The procedure for determining the Kf factor is outlined in Agriculture Handbook 703, “Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE),” USDA, Agricultural Research Service, 1997.

Depth to the upper and lower boundaries of each layer is indicated.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments. In horizons where total rock fragments are 15 percent or more, by volume, the Kw factor is always less than the Kf factor.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. Soil horizons that do not have rock fragments are assigned equal Kw and Kf factors.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook.”

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Total Soil Carbon

Table 22 gives estimates of total soil carbon. Soil carbon occurs as organic and inorganic carbon.

Soil organic carbon (SOC) is carbon (C) in soil that originated from a biological source, such as plants, animals, or micro-organisms. SOC is found in both organic and mineral soil layers. The term “soil organic carbon” refers only to the carbon occurring in soil organic matter (SOM). Soil organic carbon makes up about one-half the weight of soil organic matter. The rest of SOM is mostly oxygen, nitrogen, and hydrogen.

Soil inorganic carbon (SIC) is carbon found in soil carbonates, typically as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. Carbonates in soils are most common in areas where evaporation rates exceed precipitation, as is the case in most desert environments. Typically, the carbonates accumulated from carbonatic dust or from solution during periods of wetter climates. Soil inorganic carbon also occurs in soils that formed in marl in all regions of the country.

The SOC and SIC contents are reported in kilograms per square meter to a depth of 2 meters or to a representative depth of either hard bedrock or a cemented horizon. The SOC and SIC values are on a whole soil basis, corrected for rock fragments.

SOC can be an indicator of overall soil fertility and soil quality that affects ecosystem function. SOM is the main reservoir for most plant nutrients, such as phosphorus and nitrogen. Managing for SOC by managing for SOM increases the content of these elements and improves soil resiliency.

Soil organic matter binds soil particles together and thus increases soil porosity and water infiltration and allows better root penetration and waterflow into the soil. Greater inflow of water reduces the hazard of erosion and the rate of surface water runoff.

Greater SOC levels improve not only soil quality but also the quality of air and water. Soil acts as a filter and improves water quality. Fertile soils that support plant life remove CO_2 from the atmosphere and increase oxygen levels through photosynthesis. Maintaining the level of soil organic carbon reduces C release into the atmosphere and thus can lessen the effects of global warming.

SIC influences the types of plants that will grow. High SIC levels are commonly associated with a higher soil pH, which limits the types of plants that will thrive.

Like SOM, soil carbonates, the source of SIC, also bind soil particles together. They fill voids in the soil and thus can reduce soil porosity. Compacted soil carbonates may restrict root penetration and waterflow into the soil.

Chemical Soil Properties

Table 23 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Water Features

Table 24 gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. **Table 24** indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 25 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Kinds of restrictions include bedrock, cemented layers, dense layers, and frozen layers. The table indicates the kind and thickness of the restrictive layer, both of which significantly affect the ease of excavation. If no restriction exists, the table reports “No restriction.” *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (K_{sat}), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2010). 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. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The names for the orders and taxonomic soil properties relate to Greek, Latin, or other root words that reveal something about the soil. 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-loamy, mixed, active, 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.

Most parks are mapped to the series level. The names of soil series are selected by the soil scientists during the course of mapping. The series names are commonly geographic place names or are coined. Because of access limitations and soil variability, soils in some remote areas are classified at the great group or subgroup level.

Table 26 indicates the order, suborder, great group, subgroup, and family of the soil series in the park. **Table 27** displays classification as a key sorted by soil order.

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” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 2010). 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.

Atkins Series

The Atkins series consists of very deep, poorly drained soils that formed in loamy alluvium derived from interbedded Pennsylvanian-age sedimentary rock. Atkins soils are on flood plains in mountain valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Atkins mucky loam; Fayette County, West Virginia; on a 0.5 percent slope in a forested area on the flood plain of a tributary of Mann’s Creek, 150 feet south of County Road 11 (Old Clifftop Road), near the entrance to Camp Washington Carver; at an elevation of 702 meters (2,303 feet); lat. 38 degrees 00 minutes 27 seconds N. and long. 80 degrees 57 minutes 06 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A1—0 to 9 centimeters (0 to 4 inches); dark reddish brown (5YR 2.5/2) (broken face) mucky loam; weak medium granular structure; very friable; common fine to medium and many very fine roots; 3 percent fine faint spherical weakly cemented dark reddish brown (2.5YR 3/3) iron-manganese concretions on surfaces along root channels; strongly acid, pH 5.3 by Hellige-Truog; clear wavy boundary.

A2—9 to 28 centimeters (4 to 11 inches); black (5Y 2.5/1) (broken face) loam; weak fine structure; very friable; few medium and common fine to very fine roots; 2 percent fine distinct dark reddish brown (5YR 3/3) masses of oxidized iron on faces of peds, 3 percent medium prominent brown (10YR 4/3) masses of oxidized iron on surfaces along root channels, and 10 percent medium prominent dark gray (2.5Y 4/1) iron depletions throughout; strongly acid, pH 5.5 by Hellige-Truog; clear wavy boundary.

Bg1—28 to 45 centimeters (11 to 18 inches); dark gray (5Y 4/1) and grayish brown (2.5Y 5/2) (broken face) loam; weak coarse subangular blocky structure; friable; few very fine roots; 2 percent fine prominent dark reddish brown (5YR 3/3) masses of oxidized iron on surfaces along root channels; strongly acid, pH 5.5 by Hellige-Truog; gradual wavy boundary.

Bg2—45 to 68 centimeters (18 to 27 inches); olive gray (5Y 4/2) (broken face) fine gravelly sandy loam; weak medium subangular blocky structure; friable; 20 percent coarse prominent dark yellowish brown (10YR 3/4) masses of oxidized iron on faces of peds; 25 percent quartz gravel; strongly acid, pH 5.5 by Hellige-Truog; gradual wavy boundary.

Bg3—68 to 90 centimeters (27 to 35 inches); olive gray (5Y 4/2) (broken face) fine sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; very friable; 1 percent medium distinct brown (10YR 4/3) masses of oxidized iron on faces of peds; strongly acid, pH 5.5 by Hellige-Truog; gradual wavy boundary.

Bg4—90 to 102 centimeters (35 to 40 inches); olive gray (5Y 4/2) (broken face) gravelly fine sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; 35 percent coarse prominent dark yellowish brown (10YR 4/4) masses of oxidized iron on faces of peds; 15 percent quartz gravel; strongly acid, pH 5.5 by Hellige-Truog; gradual wavy boundary.

Cg—102 to 200 centimeters (40 to 79 inches); 40 percent dark gray (5Y 4/1) and 55 percent gray (5Y 5/1) (broken face) loam; massive; firm, slightly sticky and slightly plastic; 1 percent fine prominent brown (7.5YR 4/4) and 3 percent medium prominent light olive brown (2.5Y 5/4) masses of oxidized iron throughout; 1 percent very weakly cemented charcoal fragments and 5 percent quartz gravel; moderately acid, pH 5.8 by Hellige-Truog.

Range in Characteristics

Solum thickness: 64 to 127 centimeters (25 to 50 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragment content: Commonly none; may range from 0 to 20 percent, by volume, in the solum and from 0 to 60 percent in the C horizon
Soil reaction: Strongly acid or very strongly acid; ranging to moderately acid below a depth of 102 centimeters (40 inches)

The A horizon has hue of 10YR or 2.5Y, value of 2 to 7, and chroma of 1 to 4. Redoximorphic features have hue of 5Y to 5YR, value of 4 or 5, and chroma of 2 to 8. Texture of the fine-earth fraction is loam or silt loam or, less commonly, fine sandy loam or silty clay loam.

The B horizon is neutral in hue or has hue of 7.5YR to 5Y, has value of 4 to 7, and has chroma of 0 to 2. Redoximorphic features have hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 8. Soft manganese and iron masses occur in some pedons and have hue of 2.5YR to 7.5YR, value of 2 to 3, and chroma of 0 to 2. Texture of the fine-earth fraction, is loam, silt loam, clay loam, or silty clay loam or, less commonly, sandy loam or fine sandy loam.

The C horizon is neutral in hue or has hue of 7.5YR to 5PB, has value of 4 to 7, and has chroma of 0 to 8. It may be stratified. Texture of the fine-earth fraction is loam, clay loam, silt loam, silty clay loam, sandy loam, or sandy clay loam. Some pedons have a 2C horizon of sand and gravel below a depth of 3 feet.

Berks Series

The Berks series consists of moderately deep, well drained soils that formed in residuum weathered from Pennsylvanian-age and upper Mississippian-age interbedded shale, siltstone, and fine grained sandstone (fig. 22). Berks soils are on mountain slopes. Slopes range from 25 to 90 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

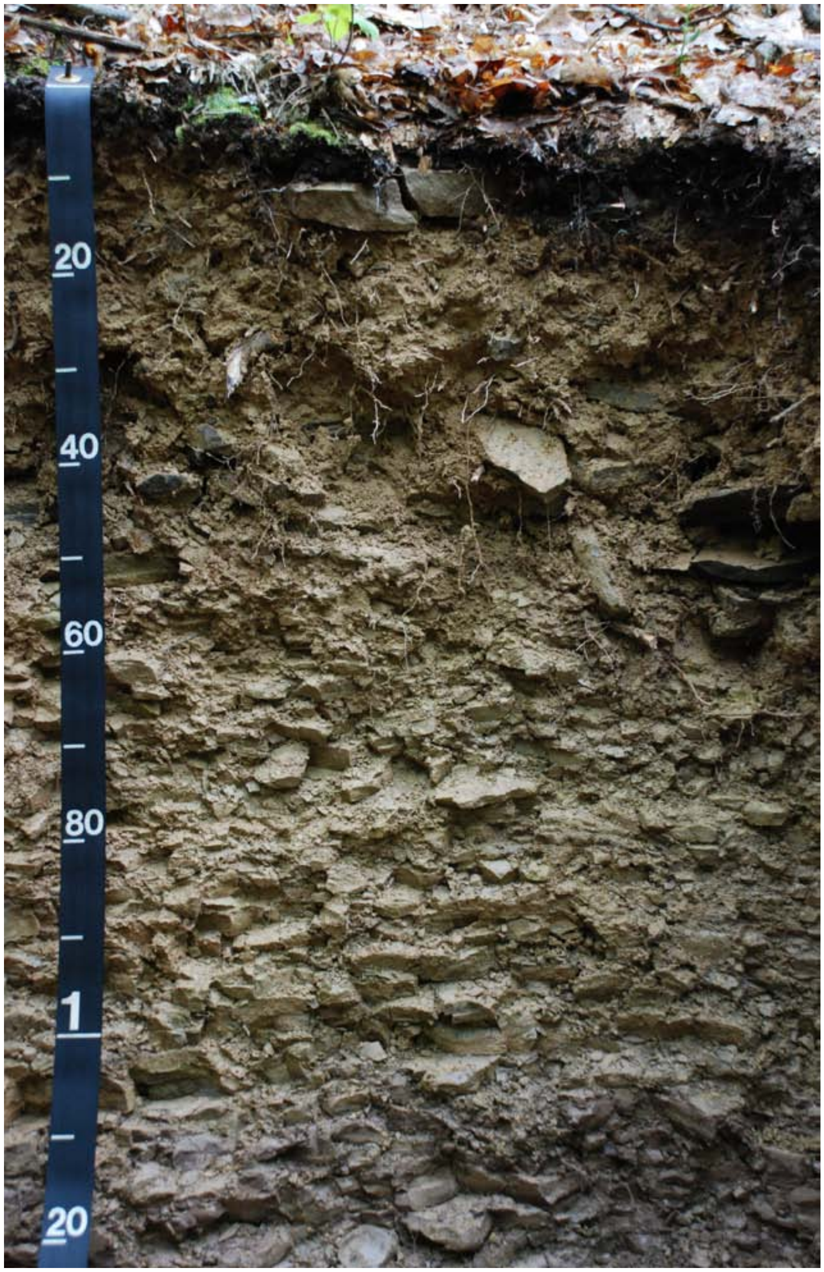


Figure 22.—Profile of Berks channery silt loam. Scale is in centimeters. Berks soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, fractured bedrock is at a depth of approximately 80 centimeters (31 inches). Large quantities of shale and sandstone rock fragments occur in the subsurface layer. (Image is from Pocahontas County, West Virginia.)

Typical Pedon

Berks channery silt loam; Fayette County, West Virginia; on a north-facing, 51 percent slope in a forested area, about 724 meters (2,375 feet) southeast of the confluence of Peters Creek and the Gauley River; at an elevation of 463 meters (1,519 feet); lat. 38 degrees 13 minutes 08 seconds N. and long. 81 degrees 02 minutes 35 seconds W.; NAD83; Ansted, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 3 centimeters (0 to 1 inch); slightly decomposed plant material; abrupt wavy boundary.

A—3 to 13 centimeters (1 to 5 inches); dark brown (10YR 3/3) (crushed) channery silt loam; 19 percent clay; moderate fine and medium granular structure; very friable; 15 percent moderately cemented shale channers; very strongly acid, pH 4.6 by Hellige-Truog; clear wavy boundary.

BA—13 to 24 centimeters (5 to 9 inches); dark yellowish brown (10YR 4/4) (broken face) channery silt loam; 20 percent clay; weak medium subangular blocky structure; friable; common very fine to very coarse roots throughout; 25 percent shale channers; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Bw1—24 to 53 centimeters (9 to 21 inches); yellowish brown (10YR 5/6) (broken face) very channery silt loam; 22 percent clay; moderate medium subangular blocky structure; friable; common medium coarse and few very fine roots throughout; 10 percent strongly cemented shale flagstones and 25 percent moderately cemented shale channers; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

Bw2—53 to 75 centimeters (21 to 30 inches); yellowish brown (10YR 5/6) (broken face) very channery silt loam; 22 percent clay; weak medium subangular blocky structure; friable; few fine to coarse roots throughout; 40 percent moderately cemented shale channers; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

Bw3—75 to 85 centimeters (30 to 33 inches); yellowish brown (10YR 5/4) (broken face) very channery silt loam; 23 percent clay; 1 percent fine prominent dark yellowish brown (10YR 4/6) and 1 percent fine prominent brown (10YR 5/3) mottles; weak coarse subangular blocky structure; friable; 10 percent cemented shale flagstones and 35 percent moderately cemented shale channers; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

C—85 to 94 centimeters (33 to 37 inches); yellowish brown (10YR 5/4) (broken face) very channery silt loam; 23 percent clay; 1 percent fine prominent dark yellowish brown (10YR 4/6) and 1 percent fine prominent brown (10YR 5/3) mottles; massive; friable; 40 percent moderately cemented shale channers; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

Cr—94 to 109 centimeters (37 to 43 inches); yellowish brown (10YR 5/4) weathered shale bedrock; moderate excavation difficulty; abrupt wavy boundary.

R—109 centimeters (43 inches); unweathered shale bedrock; high excavation difficulty.

Range in Characteristics

Solum thickness: 30 to 102 centimeters (12 to 40 inches)
Depth to bedrock: 50 to 102 centimeters (20 to 40 inches)
Rock fragment content: 10 to 50 percent in the Ap and A horizons, 15 to 75 percent in individual horizons of the B horizon, and 35 to 90 percent in the C horizon; average volume in the particle-size control section is more than 35 percent
Soil reaction: Extremely acid to slightly acid throughout the profile

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Texture of the fine-earth fraction is loam or silt loam.

The B horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. Hue of 5YR is restricted to the lower part of the horizon. Texture of the fine-earth fraction is loam, silt loam, or silty clay loam. The horizon contains 5 to 32 percent clay and 40 to 60 percent silt.

Structure is weak or moderate, fine or medium subangular blocky structure in the Bw horizon and is typically obscured by the rock fragments in a CB horizon.

The C horizon (if it occurs) has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 8. Texture of the fine-earth fraction is loam or silt loam.

Cateache Series

The Cateache series consists of moderately deep, well drained soils that formed in residuum from interbedded shale and sandstone. Cateache soils are on mountain slopes, ridges, and structural benches. Slopes range from 8 to 80 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Cateache channery silt loam (fig. 23); Summers County, West Virginia; on a 74 percent slope in a forested area, about 305 meters (1,000 feet) north of Lick Creek and 7.2 kilometers (4.5 miles) southeast of the intersection of County Route 4 and Interstate Highway 64 at Green Sulphur Springs; at an elevation of 695 meters (2,280 feet); lat. 37 degrees 46 minutes 48 seconds N. and long. 80 degrees 45 minutes 44 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A—0 to 9 centimeters (0 to 4 inches); dark brown (7.5YR 3/2) (crushed) channery silt loam; weak fine and medium granular structure; very friable; common very fine to very coarse roots throughout; 2 percent moderately cemented siltstone flagstones and 20 percent moderately cemented siltstone channers; very strongly acid, pH 4.8 by pH meter 1:1 water; clear wavy boundary.

Bt1—9 to 21 centimeters (4 to 8 inches); reddish brown (5YR 4/3) (broken face) very channery silty clay loam; weak fine and medium subangular blocky structure; friable; common very fine to very coarse roots throughout; 4 percent faint clay films on all faces of peds; 2 percent strongly cemented siltstone flagstones and 36 percent moderately cemented siltstone channers; very strongly acid, pH 4.9 by pH meter 1:1 water; clear wavy boundary.

Bt2—21 to 53 centimeters (8 to 21 inches); dark reddish brown (5YR 3/3) (broken face) channery silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine to medium roots throughout; 10 percent faint clay films on all faces of peds; 2 percent strongly cemented siltstone flagstones and 30 percent moderately cemented siltstone channers; very strongly acid, pH 5.1 by pH meter 1:1 water; clear wavy boundary.

Bt3—53 to 75 centimeters (21 to 30 inches); dark reddish brown (2.5YR 3/4) (broken face) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots throughout; 30 percent faint clay films on all faces of peds; 10 percent moderately cemented siltstone channers; moderately acid, pH 5.7 by pH meter 1:1 water; gradual wavy boundary.

Bt4—75 to 92 centimeters (30 to 36 inches); dark reddish brown (2.5YR 3/4) (broken face) flaggy silty clay; moderate fine and medium subangular blocky structure; friable; common fine roots throughout; 60 percent faint clay films on all faces of peds; 10 percent strongly cemented siltstone flagstones and 11 percent moderately cemented siltstone channers; moderately acid, pH 5.8 by pH meter 1:1 water; abrupt broken boundary.

Cr—92 centimeters (36 inches); dark reddish brown (2.5YR 3/3) (crushed) highly weathered and fractured siltstone bedrock; moderate excavation difficulty.

Range in Characteristics

Solum thickness: 46 to 102 centimeters (18 to 40 inches)
Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)

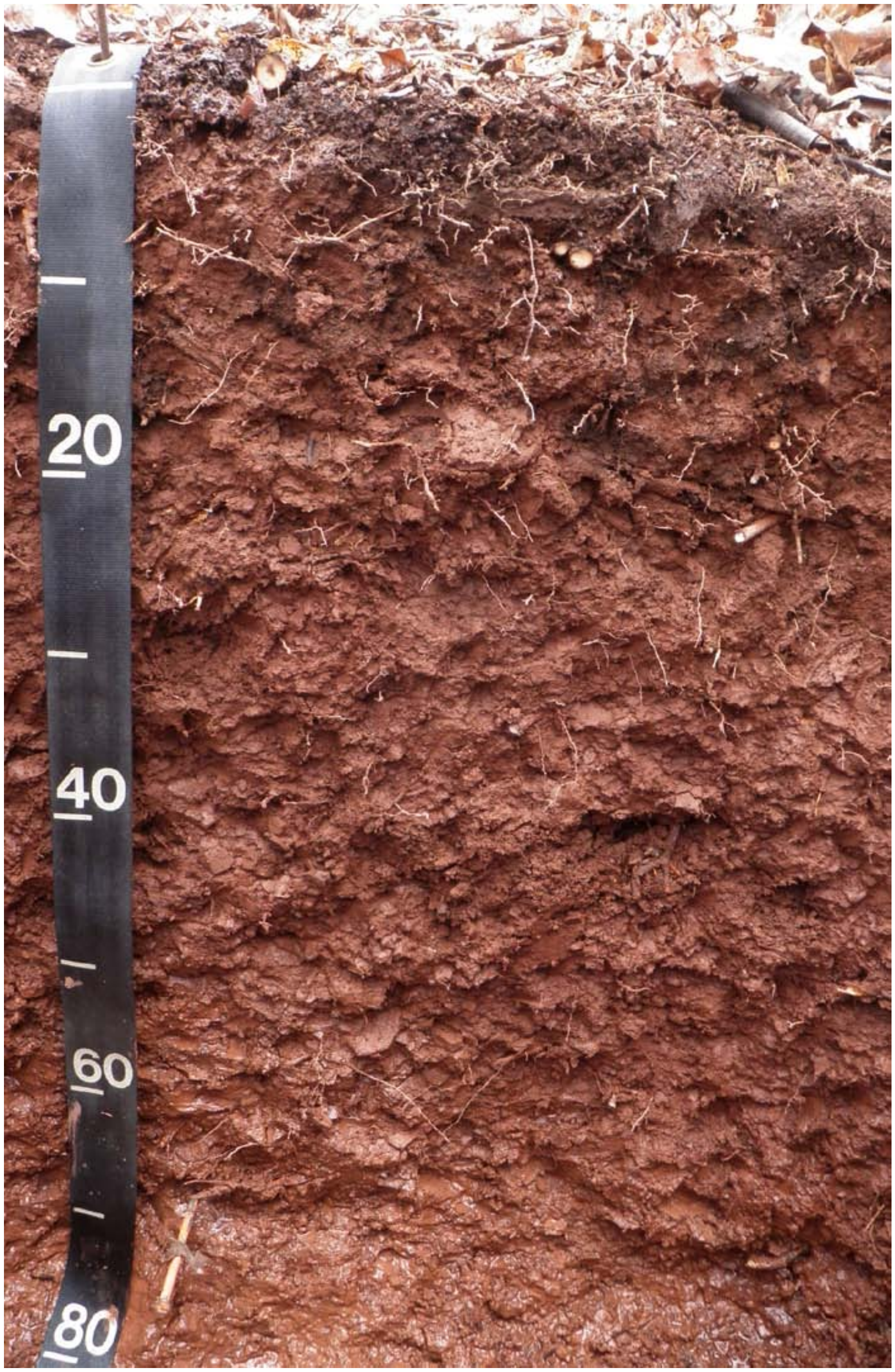


Figure 23.—Profile of Cateache channery silt loam. Scale is in centimeters. Cateache soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, soft fractured bedrock is at a depth of 72 centimeters (28 inches). The red color is the result of weathering and oxidation of iron-rich shale and sandstone parent materials from the Hinton Formation of the Mauch Chunk Geologic Group. (Image is from Tucker County, West Virginia.)

Rock fragments: 5 to 25 percent, by volume, in the A and BA horizons, 10 to 50 percent in the Bt horizon, and 35 to 80 percent in the BC and C horizons; average of 15 to 35 percent, by volume, in the particle-size control section; dominantly

highly weathered channers and flagstones of reddish brown siltstone but including shale and fine-grained sandstone
Soil reaction: Very strongly acid to moderately acid

The O horizon (if it occurs) consists of slightly to highly decomposed organic matter derived from hardwood leaf litter. Pedons in forested areas commonly have an O horizon that is up to 10 centimeters (4 inches) thick.

The A horizon has hue of 10YR to 5YR and value and chroma of 2 to 4. Texture is loam, silt loam, or silty clay loam.

The BA horizon (if it occurs) has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 2 to 4. Texture is loam, silt loam, or silty clay loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 to 6. Texture is silt loam, silty clay loam, or silty clay.

The BC horizon (if it occurs) has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 to 6. Texture is silt loam, silty clay loam, or silty clay.

The C horizon (if it occurs) has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 2 to 4. Texture is silt loam, silty clay loam, or silty clay.

Cedarcreek Series

The Cedarcreek series consists of very deep, well drained soils that formed in acid regolith from the surface mining of Pennsylvanian-age coal. Slopes range from 0 to 60 percent. The mean annual precipitation is about 1,002 millimeters (39.45 inches), and the mean annual temperature is about 10.2 degrees C (50.4 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents

Typical Pedon

Cedarcreek very channery loam; Fayette County, West Virginia; on a 45 percent slope in an outslope area of a surface mine, about 0.2 mile north of County Route 41/12 on County Route 25/2; at an elevation of 951 meters (3,120 feet); lat. 37 degrees 55 minutes 39 seconds N. and long. 80 degrees 58 minutes 26 seconds W.; NAD83; Danese, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 1 centimeter (0 to 0.5 inch); slightly decomposed plant material.

A—1 to 10 centimeters (0.5 inch to 4 inches); dark yellowish brown (10YR 4/4) (broken face) very channery loam; 20 percent clay; weak fine granular structure; very friable, slightly sticky and slightly plastic; common coarse to very fine roots; 2 percent flat coal fragments, 18 percent shale channers, and 20 percent sandstone channers; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

AC—10 to 25 centimeters (4 to 10 inches); dark yellowish brown (10YR 4/4) (broken face) very channery loam; 20 percent clay; dark gray (2.5Y 4/1) and yellowish brown (10YR 5/6) mottles; weak medium and fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine to coarse roots; 2 percent coal fragments, 18 percent shale channers, and 20 percent sandstone channers; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

C1—25 to 61 centimeters (10 to 24 inches); yellowish brown (10YR 5/4) (broken face) extremely channery loam; 22 percent clay; dark gray (2.5Y 4/1) and yellowish brown (10YR 5/6) mottles; massive; friable, slightly sticky and slightly plastic; common fine to coarse roots; 3 percent coal fragments, 30 percent shale channers, and 27 percent sandstone channers; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

C2—61 to 165 centimeters (24 to 65 inches); yellowish brown (10YR 5/4) (broken face) very channery loam; 22 percent clay; yellowish brown (10YR 5/6) and dark gray (2.5Y 4/1) mottles; massive; friable, slightly sticky and slightly plastic; common fine roots; 3 percent coal fragments, 17 percent sandstone channers, and 30 percent shale channers; very strongly acid, pH 4.8 by Hellige-Truog.

Range in Characteristics

Depth to solum (A and AC horizons): 10 to 51 centimeters (4 to 20 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 15 to 80 percent, by volume, throughout the profile with an average of 35 percent or more in the particle-size control section; mostly channers but including stones and a few boulders; fragments are sandstone, siltstone, shale, and coal, and the percentage of any one rock type is less than 65 percent of the total rock fragments in the control section
Soil reaction: Strongly acid to extremely acid, except for surface layers that have been limed

The A horizon is neutral in hue or has hue of 7.5YR to 5Y, has value of 2 to 5, and has chroma of 1 to 6. Texture is loam, silt loam, or sandy loam. The A horizon of some pedons was formed by stockpiling natural soil and spreading it over the land surface. In these pedons, the A horizon is 10 to 50 centimeters (4 to 20 inches) thick.

Some pedons have developed an AC horizon. This horizon is neutral in hue or has hue of 7.5YR to 5Y, has value of 2 to 5, and has chroma of 2 to 6. Texture is loam, silt loam, or sandy loam.

The C horizon is neutral in hue or has hue of 7.5YR to 5Y, has value of 2 to 6, and has chroma of 1 to 8. Texture is typically loam or silt loam, but the range includes sandy loam.

Chavies Series

The Chavies series consists of very deep, well drained soils that formed in mixed alluvium derived from nonacid, interbedded, mixed Pennsylvanian-age and Mississippian-age sandstone, shale, and siltstone (fig. 24). Chavies soils are on river terraces in river valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Chavies sandy loam; Raleigh County, West Virginia; on a 3 percent slope in a forested area on a river terrace of the New River near the Grandview Sandbar Campground; at an elevation of 358 meters (1,174 feet); lat. 37 degrees 51 minutes 25 seconds N. and long. 81 degrees 03 minutes 05 seconds W.; NAD83; Prince, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A1—0 to 6 centimeters (0 to 2 inches); dark gray (10YR 4/1) (broken face and dry) sandy loam, very dark brown (10YR 2/2) (broken face and moist); 5 percent clay; moderate medium granular structure; very friable; moderately acid, pH 6.0 by pH meter 1:1 water; abrupt smooth boundary.

A2—6 to 25 centimeters (2 to 10 inches); grayish brown (10YR 5/2) (broken face and dry) loamy sand, very dark grayish brown (10YR 3/2) (broken face and moist); 3 percent clay; weak fine granular structure; loose; strongly acid, pH 5.3 by pH meter 1:1 water; clear wavy boundary.

Figure 24.—Profile of Chavies fine sandy loam. Scale is in centimeters. Chavies soils formed in alluvium deposited on higher stream terraces during rare flood events. Note the absence of rock fragments throughout the soil profile. Chavies soils are higher on the landscape than soils such as Craigsville that have many fragments throughout.

BE—25 to 42 centimeters (10 to 17 inches); dark grayish brown (10YR 4/2) (broken face) sandy loam; 5 percent clay; weak fine granular structure; very friable; strongly acid, pH 5.3 by pH meter 1:1 water; clear wavy boundary.

Bt1—42 to 67 centimeters (17 to 26 inches); dark yellowish brown (10YR 4/4) (broken face) sandy loam; 8 percent clay; weak coarse subangular blocky structure; very friable; 2 percent faint clay bridges between sand grains; moderately acid, pH 5.9 by pH meter 1:1 water; gradual wavy boundary.

Bt2—67 to 127 centimeters (26 to 50 inches); dark yellowish brown (10YR 4/4) (broken face) sandy loam; 15 percent clay; weak coarse subangular blocky structure; very friable; 6 percent faint clay bridges between sand grains; slightly acid, pH 6.2 by pH meter 1:1 water; clear wavy boundary.

BC—127 to 173 centimeters (50 to 68 inches); dark yellowish brown (10YR 4/4) (broken face) sandy loam; 12 percent clay; weak very coarse prismatic structure; very friable; 10 percent sandstone gravel; slightly acid, pH 6.4 by pH meter 1:1 water.

Range in Characteristics

Solum thickness: 76 to 152 centimeters or more (30 to 60 inches or more)
Depth to bedrock: More than 200 centimeters (80 inches)

Rock fragments: 0 to 15 percent, by volume, in the solum and 0 to 30 percent in the substratum; sandstone or quartzitic gravel that range in size from 1 to 8 centimeters (0.25 inch to about 3 inches); the volume and size of fragments generally increase as depth increases
Soil reaction: Very strongly acid to neutral

The A horizon (and Ap horizon, if it occurs) has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. Texture is fine sandy loam, sandy loam, loam, silt loam, or loamy sand.

The BE horizon (if it occurs) has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. Texture is fine sandy loam, sandy loam, loam, silt loam, or loamy sand.

The Bt horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have mottles in shades of brown in the lower B horizons. Texture is silt loam, fine sandy loam, or loam.

The BC horizon and the C horizon (if it occurs) have hue of 10YR to 5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons, they are mottled in shades of brown and gray. These horizons are commonly silt loam, fine sandy loam, or loam but can also be loamy sand or sandy loam and their gravelly analogues or be stratified.

Clifftop Series

The Clifftop series consists of moderately deep, well drained soils that formed in residuum from Pennsylvanian-age acid shale, siltstone, and fine grained sandstone. Clifftop soils are on mountain ridges and slopes. Slopes range from 3 to 35 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Clifftop silt loam (fig. 25); Fayette County, West Virginia; on a 10 percent slope in a hayfield 270 meters (885 feet) southeast of the end of County Route 3/2 (White Road), 1,046 meters (3,432 feet) southwest of the confluence of Masons Branch and the Gauley River; the site is underlain by the Upper Nuttall Sandstone; at an elevation of 427 meters (1,401 feet); lat. 38 degrees 13 minutes 08 seconds N. and long. 81 degrees 00 minutes 17 seconds W.; NAD83; Ansted, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Ap—0 to 18 centimeters (0 to 7 inches); brown (10YR 4/3) (broken face) silt loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; common fine and many very fine roots; 5 percent moderately cemented acid shale channers; strongly acid, pH 5.2 by Hellige-Truog; abrupt smooth boundary.
BA—18 to 28 centimeters (7 to 11 inches); dark yellowish brown (10YR 4/4) (broken face) silt loam; 20 percent clay; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and common very fine roots; 5 percent moderately cemented acid shale channers; very strongly acid, pH 4.9 by Hellige-Truog; clear wavy boundary.
Bt—28 to 51 centimeters (11 to 20 inches); yellowish brown (10YR 5/4) (broken face) loam; 23 percent clay; 10 percent coarse prominent brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and few very fine roots; 10 percent moderately cemented

Figure 25.—Profile of Clifftop silt loam. Scale is in centimeters. Clifftop soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, fractured bedrock is at a depth of approximately 60 centimeters (24 inches). (Image is from Preston County, West Virginia.)

acid shale channers; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

BC—51 to 61 centimeters (20 to 24 inches); yellowish brown (10YR 5/4) (broken face) channery loam; 19 percent clay; 15 percent coarse prominent brownish yellow (10YR 6/8) mottles; weak coarse subangular blocky structure; firm, slightly sticky and slightly plastic; 20 percent moderately cemented acid shale channers; very strongly acid, pH 4.6 by Hellige-Truog; gradual wavy boundary.

Cr—61 centimeters (24 inches); light yellowish brown (2.5Y 6/3) moderately cemented acid shale bedrock; moderate excavation difficulty.

Range in Characteristics

Solum thickness: 30 to 91 centimeters (12 to 36 inches)
Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)
Rock fragment content: 0 to 25 percent in the upper part of the solum and 15 to 65 percent in the BC and C horizons
Soil reaction: Strongly acid to extremely acid throughout the profile

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4. Texture is silt loam or loam.

The BA horizon (or similar transitional horizon) has hue of 7.5YR to 2.5Y, value of 3 to 6 (6 or more dry), and chroma of 3 to 6. Texture is silt loam or loam.

The E horizon (if it occurs) has hue of 10YR to 2.5Y, value of 4 to 6 (6 or more dry), and chroma of 2 to 6. Texture is silt loam or loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture is silt loam, silty clay loam, clay loam, or loam.

The BC horizon (if it occurs) has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture is silt loam, silty clay loam, clay loam, or loam.

The C horizon (if it occurs) has hue of 7.5YR to 2.5Y and value and chroma of 4 to 8. Mottles in shades of yellowish brown, gray, and reddish brown may occur. Texture is silt loam, silty clay loam, silty clay, clay loam, or loam.

Combs Series

The Combs series consists of very deep, well drained soils that formed in recent alluvium derived primarily from Mississippian-age deposits. Combs soils are on flood plains in river valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Fluventic Hapludolls

Typical Pedon

Combs fine sandy loam; Raleigh County, West Virginia; on a 1 percent slope in a forested area about 800 meters (0.5 mile) downstream from the mouth of Sewell Branch on the New River, across the New River from the town of Meadow Creek; at an elevation of 384 meters (1,259 feet); lat. 37 degrees 48 minutes 26 seconds N. and long. 80 degrees 55 minutes 34 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A—0 to 25 centimeters (0 to 10 inches); brown (10YR 4/3) (crushed and dry) fine sandy loam, very dark grayish brown (10YR 3/2) (crushed and moist); 12 percent clay; weak medium granular structure; very friable; many very fine to coarse and common very coarse roots; moderately acid, pH 6.0 by Hellige-Truog; clear smooth boundary.

Bw1—25 to 76 centimeters (10 to 30 inches); brown (10YR 4/3) (broken face) fine sandy loam; 12 percent clay; weak medium subangular blocky structure; friable; common very fine to very coarse roots; slightly acid, pH 6.2 by Hellige-Truog; clear wavy boundary.

Bw2—76 to 122 centimeters (30 to 48 inches); brown (10YR 4/3) (broken face) sandy loam; 13 percent clay; weak medium and coarse subangular blocky structure; friable; common very fine to medium roots; slightly acid, pH 6.2 by Hellige-Truog; gradual wavy boundary.

C—122 to 200 centimeters (48 to 79 inches); dark yellowish brown (10YR 4/4) (broken face) cobbly sandy loam; 14 percent clay; massive; friable; few very fine roots; 15 percent sandstone cobbles; neutral, pH 7.0 by Hellige-Truog.

Range in Characteristics

Solum thickness: 102 to 200 centimeters (40 to 79 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: Up to 15 percent, by volume, throughout the profile; gravel and cobbles
Soil reaction: Moderately acid to neutral

The A horizon has hue of 10YR or 7.5YR, value of 3, and chroma of 2 or 3. Texture is silt loam, loam, sandy loam, or fine sandy loam.

The AB horizon (if it occurs) has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. Texture is similar to that of the A horizon.

The Bw horizon has hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. In some pedons, however, the upper part of the Bw horizon has value of 3 and chroma of 2 or 3. Texture is loam, silt loam, sandy loam, or fine sandy loam. The horizon is sandy clay loam below a depth of 100 centimeters (40 inches) in some pedons.

The BC horizon (if it occurs) has colors and textures similar to those of the Bw horizon. It is commonly stratified.

The C horizon (if it occurs) has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons in swales or near drainageways display redoximorphic depletions and iron masses below a depth of 100 centimeters (40 inches). The horizon is loam, silt loam, sandy loam, or sandy clay loam and is commonly stratified.

Cookport Series

The Cookport series consists of deep and very deep, moderately well drained soils that formed in residuum weathered from Pennsylvanian-age sandstone and possibly shale and siltstone. Cookport soils are on broad mountain ridges. Slopes range from 3 to 8 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Aquic Fragiudults

Typical Pedon

Cookport silt loam (fig. 26); Fayette County, West Virginia; on a northwest-facing 2 percent slope in a forested area on the north side of Dunloup Creek, near the town Prudence and near the sewage treatment plant on National Park Service land; at an elevation of 526 meters (1,725 feet); lat. 37 degrees 55 minutes 48 seconds N. and long. 81 degrees 07 minutes 10 seconds W.; NAD83; Thurmond, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 3 centimeters (0 to 1 inch); slightly decomposed plant material; strongly acid, pH 5.6 by Hellige Troug.

A—3 to 12 centimeters (1 to 5 inches); black (10YR 2/1) (broken face) silt loam; 10 percent clay; weak medium subangular blocky structure parting to weak fine to very coarse granular; very friable; common fine to coarse roots throughout; extremely acid, pH 4.4 by Hellige-Truog; very abrupt wavy boundary.

AE—12 to 25 centimeters (5 to 10 inches); light olive brown (2.5Y 5/3) (broken face) silt loam; 12 percent clay; moderate medium and weak coarse subangular blocky structure; friable; common fine to coarse roots throughout; common fine and

Figure 26.—Profile of Cookport silt loam. Scale is in centimeters. A fragipan (a dense subsurface horizon that restricts water flow and root penetration) begins at a depth of approximately 70 centimeters (28 inches). (Image is from Greenbrier County, West Virginia.)

medium irregular and common fine tubular pores throughout; very strongly acid, pH 4.9 by Hellige-Truog; abrupt wavy boundary.

Bt—25 to 60 centimeters (10 to 24 inches); olive yellow (2.5Y 6/6) (broken face) silt loam; 20 percent clay; moderate medium subangular blocky structure parting to weak very coarse subangular blocky; firm; common fine to coarse roots throughout; common fine and medium tubular pores; 1 percent coarse faint pale yellow (2.5Y 7/4) iron depletions in matrix; very strongly acid, pH 4.7 by Hellige-Truog; gradual wavy boundary.

Btx1—60 to 78 centimeters (24 to 31 inches); yellowish brown (10YR 5/6) (broken face) loam; 22 percent clay; weak very coarse prismatic structure parting to moderate thick platy; firm to brittle; common fine to medium roots throughout; common fine to medium vesicular pores; 10 percent coarse distinct gray (5Y 6/1) and pale yellow (2.5Y 7/3) iron depletions and 10 percent coarse distinct reddish yellow (7.5YR 6/8) masses of oxidized iron on vertical faces of peds; very strongly acid, pH 4.7 by Hellige-Truog; clear wavy boundary.

Btx2—78 to 121 centimeters (31 to 48 inches); yellowish brown (10YR 5/6) (broken face) clay loam; 31 percent clay; weak coarse prismatic structure parting to weak thin platy; firm; brittle; common fine roots throughout; common fine and medium vesicular pores; dark yellowish brown (10YR 4/6) masses of oxidized iron lining pores, 25 percent medium prominent gray (10YR 6/1) iron depletions infused into matrix along faces of peds, and 25 percent medium prominent reddish yellow (7.5YR 6/8) and red (2.5YR 5/8) masses of oxidized iron infused into matrix along faces of peds; very strongly acid, pH 4.7 by Hellige-Truog; clear wavy boundary.

2Cg—121 to 193 centimeters (48 to 76 inches); 20 percent red (2.5YR 4/8), 35 percent brownish yellow (10YR 6/8), and 45 percent light gray (2.5Y 7/2) (broken face) silty clay; 46 percent clay; weak thin platy structure parting to massive; extremely firm, moderately sticky and moderately plastic; very strongly acid, pH 4.5 by Hellige-Truog; gradual smooth boundary.

Cr—193 centimeters (76 inches); moderately cemented sandstone; high excavation difficulty.

Range in Characteristics

Solum thickness: 71 to 122 centimeters (28 to 48 inches)
Depth to fragipan: 41 to 76 centimeters (16 to 30 inches)
Depth to bedrock: 102 to 183 centimeters (40 to 72 inches)
Rock fragments: 0 to 30 percent in the solum and 10 to 65 percent in the C horizon; mostly sandstone gravel or channers
Soil reaction: Strongly acid to extremely acid

The A horizon has hue of 7.5YR, 10YR, or 2.5Y and value and chroma of 2 or 3. Texture of the fine-earth fraction is silt loam, loam, or sandy loam.

The BA horizon (if it occurs) has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 to 6. Texture of the fine-earth fraction is silt loam, loam, or sandy loam.

The Bt horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture of the fine-earth fraction is loam, sandy loam, clay loam, or sandy clay loam.

The Btx horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 to 8. Texture of the fine-earth fraction is loam, sandy clay loam, sandy loam, or clay loam. Consistence is very firm or firm and brittle.

The C or Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. Texture of the fine-earth fraction is sandy loam, loam, sandy clay loam, silty clay loam, or silty clay.

The Cookport soils in New River Gorge National River are considered a taxadjunct to the series because they typically have a semiactive cation-exchange activity class. This is due to the dominance of low-activity clay minerals in the subsoil. This difference, however, does not significantly affect the use and management of the soils.

Cotaco Series

The Cotaco series consists of very deep, moderately well drained or somewhat poorly drained soils that formed in loamy sediments of acid sandstone, siltstone, and shale origin. Cotaco soils are on low stream terraces in mountain valleys. Slopes range from 3 to 8 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Aquic Hapludults

Typical Pedon

Cotaco loam (fig. 27); Fayette County, West Virginia; on a 6 percent slope in a forested area east of Craig Branch, near Kaymoor; at an elevation of 591 meters (1,939 feet); lat. 38 degrees 02 minutes 24 seconds N. and long. 81 degrees 02 minutes 46 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 4 centimeters (0 to 2 inches); slightly decomposed plant material; abrupt wavy boundary.

Oe—4 to 6 centimeters (2 to 3 inches); black (7.5YR 2.5/1) moderately decomposed plant material; abrupt wavy boundary.

A—6 to 18 centimeters (3 to 7 inches); very dark gray (2.5Y 3/1) (broken face) loam; weak medium subangular blocky structure parting to weak medium granular; very friable; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

E—18 to 25 centimeters (7 to 10 inches); light brownish gray (2.5Y 6/2) (broken face) loam; weak medium subangular blocky structure; very friable; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

BE—25 to 40 centimeters (10 to 16 inches); light olive brown (2.5Y 5/3) (broken face) loam; 10 percent clay; weak medium subangular blocky structure; friable; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Btg1—40 to 58 centimeters (16 to 23 inches); grayish brown (2.5Y 5/2) (broken face) loam; 14 percent clay; moderate medium subangular blocky structure; friable, nonsticky and slightly plastic; 10 percent clay films on vertical faces of peds; 20 percent medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in matrix; extremely acid, pH 4.3 by Hellige-Truog; gradual wavy boundary.

Btg2—58 to 75 centimeters (23 to 30 inches); grayish brown (2.5Y 5/2) (broken face) loam; 21 percent clay; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; 15 percent clay films on vertical faces of peds; 5 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron on surfaces along pores and 35 percent medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in matrix; extremely acid, pH 4.3 by Hellige-Truog; clear wavy boundary.

Btg3—75 to 190 centimeters (30 to 75 inches); gray (2.5Y 6/1) (broken face) loam; 25 percent clay; moderate coarse prismatic structure parting to moderate medium subangular blocky; friable, slightly sticky and slightly plastic; 25 percent clay films on vertical faces of peds; 5 percent fine prominent strong brown (7.5YR 4/6) masses of oxidized iron on surfaces along pores and 15 percent medium prominent yellowish brown (10YR 5/6) masses of oxidized iron in matrix; extremely acid, pH 4.3 by Hellige-Truog; gradual wavy boundary.

BCg—190 to 200 centimeters (75 to 79 inches); gray (2.5Y 6/1) (broken face) loam; 20 percent clay; weak coarse prismatic structure parting to weak coarse subangular blocky; friable, slightly sticky and slightly plastic; 10 percent clay films on vertical

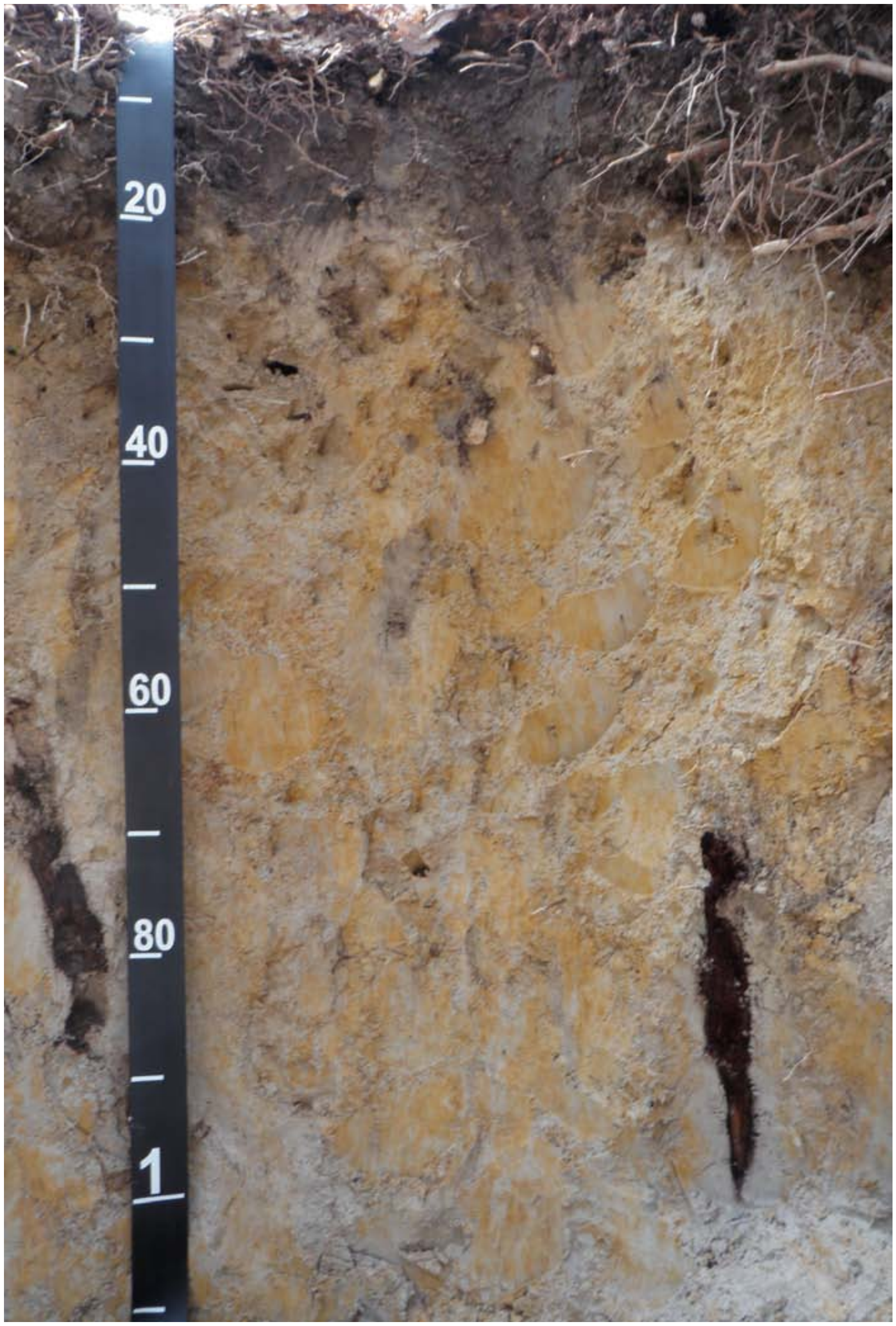


Figure 27.—Profile of Cotaco loam. Scale is in centimeters. Zones of iron depletions (gray areas) and of oxidized iron concentrations (rusty red areas) indicate the level of water saturation for prolonged periods during the year. A seasonal high water table occurs at a depth of 40 centimeters (16 inches).

faces of peds; 5 percent coarse prominent yellowish brown (10YR 5/6) masses of oxidized iron in matrix; extremely acid, pH 4.3 by Hellige-Truog.

Range in Characteristics

Solum thickness: 76 to 200 centimeters (30 to 80 inches)
Depth to bedrock: More than 152 centimeters (60 inches)

Rock fragments: 0 to 35 percent in the solum and 0 to 50 percent in the C horizon; sandstone, shale, or siltstone gravel
Soil reaction: Strongly acid to extremely acid, except in limed areas

The A horizon has hue of 10YR or 7.5YR, value of 4 or 6, and chroma of 1 to 4. Texture of the fine-earth fraction is loam, silt loam, or fine sandy loam. Some pedons have A horizons that have value of 3, but these horizons are generally less than 7 inches thick.

The E horizon and the BE horizon (if it occurs) have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 1 to 4. Texture of the fine-earth fraction is loam, silt loam, or fine sandy loam.

The Bt horizon has hue of 2.5Y to 5YR, value of 4 to 6, and chroma of 3 to 8. Texture of the fine-earth fraction is silt loam, loam, clay loam, silty clay loam, or sandy clay loam. Redoximorphic features are in shades of gray, brown, and red.

Some pedons have a BC horizon. This horizon has colors similar to those of the Bt horizon. Others pedons have lower Btg or BCg horizons that are gleyed. A few pedons have 2B horizons in the lower part of the solum.

The C, Cg, and/or 2C horizons (if they occur) have hue of 7.5YR to 2.5Y, value of 4 to 8, and chroma of 1 to 8 or are neutral in hue and have value of 4 to 8. These horizons are commonly variegated with redoximorphic features in shades of gray, brown, and red without a clearly dominant matrix color. Texture of the fine-earth fraction is silt loam, loam, clay loam, silty clay loam, or sandy clay loam. In some pedons, the C horizon is stratified.

Craigsville Series

The Craigsville series consists of very deep, well drained soils that formed in acid, sandy and gravelly alluvium derived from interbedded, mixed Pennsylvanian-age and Mississippian-age sandstone, shale, and siltstone (fig. 28). Craigsville soils are on high-energy flood plains and alluvial fans in river valleys. Slopes range from 0 to 5 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, superactive, mesic Fluventic Dystrudepts

Typical Pedon

Craigsville very stony sandy loam; Raleigh County, West Virginia; on a 2 percent slope in a forested area near the mouth of Glade Creek; at an elevation of 372 meters (1,220 feet); lat. 37 degrees 49 minutes 43 seconds N. and long. 81 degrees 00 minutes 46 seconds W.; NAD83; Prince, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; abrupt smooth boundary.
Oe—2 to 3 centimeters (1 to 1.5 inches); moderately decomposed plant material; abrupt broken boundary.
A—3 to 13 centimeters (1.5 to 5 inches); very dark brown (10YR 2/2) (crushed) very stony sandy loam; 7 percent clay; weak fine and medium granular structure; very friable; many fine to very coarse roots throughout; 10 percent sandstone cobbles and 35 percent sandstone stones; very strongly acid, pH 4.5 by Hellige-Truog; abrupt smooth boundary.
Bw1—13 to 30 centimeters (5 to 12 inches); dark brown (7.5YR 3/4) (broken face) very stony sandy loam; 7 percent clay; weak fine and medium subangular blocky structure; very friable; many fine to very coarse roots throughout; 11 percent

Figure 28.—Profile of Craigsville very gravelly sandy loam. Scale is in centimeters. Craigsville soils formed in alluvium deposited by high-energy streams. The water moved large volumes of gravel, cobbles, and stones.

sandstone cobbles and 44 percent sandstone stones; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Bw2—30 to 52 centimeters (12 to 20 inches); brown (7.5YR 4/4) (broken face) extremely stony sandy loam; 5 percent clay; weak medium subangular blocky structure; very friable; common fine and medium roots throughout; 12 percent sandstone cobbles and 48 percent sandstone stones; very strongly acid, pH 4.5 by Hellige-Truog; gradual wavy boundary.

C—52 to 165 centimeters (20 to 65 inches); strong brown (7.5YR 4/6) (crushed) extremely stony loamy sand; 3 percent clay; single grain; loose; few fine roots throughout; 15 percent sandstone cobbles and 60 percent sandstone stones; very strongly acid, pH 4.5 by Hellige-Truog.

Range in Characteristics

Solum thickness: 51 to 102 centimeters (20 to 40 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 5 to 60 percent, by volume, in the A horizon and 35 to 75 percent in the B and C horizons; gravel, cobbles, and stones
Soil reaction: Very strongly acid or strongly acid

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Texture of the fine-earth fraction ranges from sandy loam to silt loam.

The B horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 or 6. Texture of the fine-earth fraction is loam or sandy loam.

The BC horizon (if it occurs) has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 or 6. Texture of the fine-earth fraction is loam, sandy loam, or loamy sand.

The C or 2C horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6. Texture of the fine-earth fraction is loamy sand or sandy loam. Thin nonconforming horizons may have less than 15 percent gravel or cobbles.

Dekalb Series

The Dekalb series consists of moderately deep, well drained soils that formed in residuum weathered from Pennsylvanian-age acid sandstone (fig. 29). Dekalb soils are on nearly level to steep, convex mountain ridges and shoulder slopes. Slopes range from 3 to 35 percent. The mean annual precipitation is about 1,207 millimeters (47.5 inches), and the mean annual air temperature is about 10.6 degrees C (51 degrees F).

Taxonomic Classification

Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Typical Pedon

Dekalb very channery highly organic sandy loam; Fayette County, West Virginia; on a 47 percent slope in a forested area about 805 meters (2,641 feet) north of the community of Ames Heights, 115 meters (377 feet) west of Mill Creek; at an elevation of 488 meters (1,601 feet); lat. 38 degrees 05 minutes 30 seconds N. and long. 81 degrees 04 minutes 30 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material.

Oe—2 to 5 centimeters (1 to 2 inches); moderately decomposed plant material; abrupt wavy boundary.

A—5 to 12 centimeters (2 to 5 inches); black (7.5YR 2.5/1) (broken face) very channery highly organic sandy loam; moderate medium crumb structure; very friable; 70 percent sandstone channers; extremely acid, pH 4.2 by pH meter 1:1 water; abrupt irregular boundary.

Bw1—12 to 21 centimeters (5 to 8 inches); dark yellowish brown (10YR 4/6) (broken face) extremely channery sandy loam; weak medium blocky and weak fine subangular blocky structure; very friable; 60 percent sandstone channers; extremely acid, pH 3.8 by pH meter 1:1 water; clear irregular boundary.

Bw2—21 to 38 centimeters (8 to 15 inches); dark yellowish brown (10YR 4/6) (broken face) very channery sandy loam; weak medium and weak fine subangular blocky structure; very friable; 50 percent sandstone channers; extremely acid, pH 3.9 by pH meter 1:1 water; clear wavy boundary.

Bw3—38 to 55 centimeters (15 to 22 inches); light olive brown (2.5Y 5/6) (broken face) very channery sandy loam; weak medium and weak fine subangular blocky structure; very friable; 50 percent sandstone channers; very strongly acid, pH 4.5 by pH meter 1:1 water; gradual wavy boundary.

BC—55 to 68 centimeters (22 to 27 inches); light olive brown (2.5Y 5/6) (broken face) extremely channery loam; weak fine subangular blocky structure; very friable; 60 percent sandstone channers; very strongly acid, pH 4.5 by pH meter 1:1 water; abrupt smooth boundary.

R—68 centimeters (27 inches); indurated sandstone bedrock; very high excavation difficulty.

Figure 29.—Profile of Dekalb very channery loam. Scale is in centimeters. This Dekalb soil, which formed under forests, has dark organic horizons at a depth of 0 to 10 centimeters (4 inches). Dekalb soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, bedrock occurs at a depth of approximately 70 centimeters (28 inches). (Image is from Fayette County, West Virginia.)

Range in Characteristics

Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)
Rock fragments: 10 to 60 percent in individual horizons of the solum and 50 to 90 percent or more in the C horizon; amount increases as depth increases; flat, subangular or angular sandstone fragments 1 to 10 inches across
Soil reaction: Strongly acid to extremely acid throughout the profile

The A horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 to 2. An Ap horizon (occurring in cultivated areas) has hue of 10YR, value of 4, and chroma of 2 to 4. Texture is loam, fine sandy loam, or sandy loam. Structure is weak very fine or fine granular.

The E horizon (if it occurs) has hue of 10YR, value of 5 or 6, and chroma of 1 to 4. Its texture and structure are similar to those of the A horizon.

Some pedons have a BA horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is loam, sandy loam, or fine sandy loam.

The B horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 8. It is loam, fine sandy loam, or sandy loam. The average clay content is between 6 and 15 percent but ranges to 18 percent in the particle-size control section. Structure is weak to moderate, fine or coarse subangular blocky.

The BC horizon (if it occurs) has hue of 7.5YR or 10YR, value of 5 to 8, and chroma of 4 to 8. Texture of the fine-earth fraction is sandy loam, fine sandy loam, or loam.

The C horizon (if it occurs) has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture of the fine-earth fraction is sandy loam or loamy sand. Bedrock is gray to brown sandstone of varying hardness and is commonly fractured without displacement.

The Dekalb soils in New River Gorge National River are considered a taxadjunct to the series because they typically have a semiactive cation-exchange activity class. This is due to the dominance of low-activity clay minerals in the subsoil. This difference, however, does not significantly affect the use and management of the soils.

Fenwick Series

The Fenwick series consists of moderately deep, moderately well drained soils that formed in residuum weathered from Pennsylvanian-age acid sandstone or interbedded sandstone, siltstone, and shale (fig. 30). Fenwick soils are on broad mountain ridges. Slopes range from 3 to 15 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Aquic Hapludults

Typical Pedon

Fenwick silt loam; Nicholas County, West Virginia; on a 7 percent slope in a forested area about 762 meters (2,500 feet) south-southeast of the intersection of County Route 22 and a National Park Service river access road, approximately 2.41 kilometers (1.5 miles) west of Arnett Chapel; at an elevation of 430 meters (1,411 feet); lat. 38 degrees 12 minutes 34 seconds N. and long. 81 degrees 00 minutes 49 seconds W.; NAD83; Ansted, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; abrupt smooth boundary.

A—2 to 13 centimeters (1 to 5 inches); dark grayish brown (10YR 4/2) (broken face) silt loam; weak fine and medium granular structure; very friable; many very fine to coarse roots; very strongly acid, pH 4.7 by Hellige-Truog; clear smooth boundary.

BA—13 to 20 centimeters (5 to 8 inches); yellowish brown (10YR 5/4) (broken face) loam; weak medium subangular blocky structure; very friable; common very fine to medium roots; very strongly acid, pH 4.7 by Hellige-Truog; clear smooth boundary.

Bt1—20 to 56 centimeters (8 to 22 inches); yellowish brown (10YR 5/6) (broken face) loam; moderate medium subangular blocky structure; friable; few very fine to medium roots; 10 percent distinct clay films on all faces of peds; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Bt2—56 to 77 centimeters (22 to 30 inches); yellowish brown (10YR 5/4) (broken face) loam; 25 percent clay; moderate medium subangular blocky structure; friable; 25 percent distinct clay films on all faces of peds; 10 percent fine distinct strong brown (7.5YR 5/8) masses of oxidized iron and 25 percent fine and medium distinct light

Figure 30.—Representative profile of the Fenwick series. Scale is in centimeters. Fenwick soils have impermeable bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). The bedrock "perches" a seasonal high water table which gives the soil a mottled appearance. In this photo, the mottling from the seasonal high water table begins at a depth of about 60 centimeters (24 inches) and highly weathered shale bedrock begins at a depth of 70 centimeters (28 inches). (Image is from Monongalia County, West Virginia.)

brownish gray (10YR 6/2) iron depletions; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Btg—77 to 93 centimeters (30 to 37 inches); light brownish gray (10YR 6/2) (broken face) clay loam; 28 percent clay; moderate medium and coarse subangular blocky structure; firm; 30 percent distinct clay films on all faces of peds; 10 percent fine distinct yellowish brown (10YR 5/8) and 10 percent fine and medium distinct yellowish brown (10YR 5/6) masses of oxidized iron; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

BC—93 to 99 centimeters (37 to 39 inches); strong brown (7.5YR 5/6) (broken face) loam; 22 percent clay; weak medium subangular blocky structure; firm; 15 percent medium distinct pinkish gray (7.5YR 6/2) iron depletions and 25 percent medium and coarse distinct yellowish red (5YR 4/6) masses of oxidized iron; 10 percent moderately cemented siltstone gravel; extremely acid, pH 4.0 by Hellige-Truog; clear wavy boundary.

Cg—99 to 112 centimeters (39 to 44 inches); light brownish gray (10YR 6/2) (broken face) very channery loam; 20 percent clay; massive; firm; 10 percent medium and coarse distinct yellowish brown (10YR 5/8) and 30 percent coarse distinct yellowish brown (10YR 5/6) masses of oxidized iron; 35 percent moderately cemented siltstone channers; extremely acid, pH 4.0 by Hellige-Truog; abrupt wavy boundary.

R—112 centimeters (44 inches); very strongly cemented sandstone bedrock; high excavation difficulty.

Range in Characteristics

Solum thickness: 50 to 101 centimeters (20 to 40 inches)

Depth to bedrock: 101 centimeters (40 inches)

Rock fragments: 0 to 15 percent, by volume, in the A, AB, BA, and Bt horizons and 5 to 35 percent in the BC and C horizons; commonly sandstone channers and flagstones

Soil reaction: Very strongly acid to neutral in the A horizon and very strongly acid or strongly acid in the Bt, BC, and C horizons

The A horizon and the AB horizon (if it occurs) have hue of 7.5YR, 10YR, or 2.5Y and value and chroma of 2 to 4. Texture is silt loam or loam. Consistence is friable or very friable.

Some pedons have a BA horizon up to 6 inches thick. This horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. Texture is silt loam or loam. Consistence is friable.

The Bt horizon has matrix hue of 7.5YR, 10YR, or 2.5Y, value of 5 or 6, and chroma of 4 to 6. Some pedons have a Btg horizon that contains red, brown, and gray mottles or redoximorphic features. Texture of the fine-earth fraction is loam, silt loam, or clay loam. Structure is weak or moderate, fine to coarse subangular blocky. Consistence is friable in the upper part of the horizon and friable to firm in the lower part.

Most pedons have a BC horizon. This horizon has colors and textures similar to those of the Bt horizon. Structure is weak subangular blocky or platy. Consistence is firm or very firm. Part of the BC horizon may have brittle characteristics.

Many pedons have a C or Cg horizon. This horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 7, and chroma of 2 to 6. Texture of the fine-earth fraction is sandy loam, loam, silt loam, or silty clay loam. Consistence is firm or very firm.

Gilpin Series

The Gilpin series consists of moderately deep, well drained soils that formed in Pennsylvanian-age and upper Mississippian-age residuum from shale and siltstone. Gilpin soils are on mountain ridges, slopes, and structural benches. Slopes range from 3 to 90 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Fine-loamy, mixed, active, mesic Typic Hapludults

Figure 31.—Profile of Gilpin loam. Scale is in centimeters. Gilpin soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, bedrock occurs at a depth of approximately 60 centimeters (24 inches). (Image is from Marion County, West Virginia.)

Typical Pedon

Gilpin loam (fig. 31); Summers County, West Virginia; on a 16 percent slope in a forested area about 0.96 kilometer (0.6 mile) northeast of the community of Meadow Creek and 1,500 feet north of County Road 7-2; at an elevation of 622 meters (2,040 feet); lat. 37 degrees 48 minutes 47 seconds N. and long. 80 degrees 54 minutes 42 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 1 centimeter (0 to 0.5 inch); slightly decomposed plant material; abrupt broken boundary.

Oe—1 to 2 centimeters (0.5 to 1 inch); moderately decomposed plant material; abrupt wavy boundary.

A—2 to 16 centimeters (1 to 6 inches); very dark grayish brown (10YR 3/2) (crushed) loam; 19 percent clay; weak fine granular structure; very friable; many very fine and fine and common medium to very coarse roots; 5 percent very strongly cemented sandstone gravel; strongly acid, pH 5.4 by Hellige-Truog; clear smooth boundary.

BA—16 to 29 centimeters (6 to 11 inches); dark yellowish brown (10YR 4/4) (broken face) loam; 20 percent clay; weak medium subangular blocky structure; friable; common very fine to very coarse roots; 5 percent very strongly cemented sandstone gravel; strongly acid, pH 5.2 by Hellige-Truog; clear wavy boundary.

Bt1—29 to 54 centimeters (11 to 21 inches); yellowish brown (10YR 5/6) (broken face) channery loam; 24 percent clay; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine to very coarse roots; 15 percent faint clay films on vertical faces of peds; 15 percent very strongly cemented sandstone gravel; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

Bt2—54 to 70 centimeters (21 to 28 inches); strong brown (7.5YR 5/6) (broken face) channery silt loam; 25 percent clay; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very fine and fine and common medium to very coarse roots; 30 percent faint clay films on vertical faces of peds; 30 percent very strongly cemented sandstone gravel; very strongly acid, pH 4.6 by Hellige-Truog; gradual wavy boundary.

C—70 to 76 centimeters (28 to 30 inches); strong brown (7.5YR 5/6) (broken face) very channery silt loam; 25 percent clay; massive; firm, slightly sticky and slightly plastic; few very fine and fine roots; 10 percent faint clay films on rock fragments; 35 percent very strongly cemented sandstone gravel; very strongly acid, pH 4.6 by Hellige-Truog; clear wavy boundary.

R—76 to 86 centimeters (30 to 34 inches); very strongly cemented siltstone bedrock; high excavation difficulty.

Range in Characteristics

Solum thickness: 46 to 91 centimeters (18 to 36 inches)

Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)

Rock fragments: 5 to 40 percent, by volume, in the solum and 30 to 90 percent in the C horizon; mostly angular to subangular channers of shale, siltstone, and sandstone

Soil reaction: Strongly acid to extremely acid

The A horizon (if it occurs) has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. Thickness of the A horizon ranges from 2 to 5 inches. The Ap horizon (if it occurs) has hue of 10YR or 2.5Y, value of 3 to 5 (6 or 7 dry), and chroma of 2 to 4. Texture of the fine-earth fraction in the Ap or A horizon is silt loam or loam.

Some pedons have E, BE, and/or BA horizons. These horizons range to 6 inches in thickness and have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 5 to 3. Texture of the fine-earth fraction is silt loam or loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Colors tend to become redder as depth increases. Texture of the fine-earth fraction is silt loam, loam, clay loam, or silty clay loam. Clay films on faces of peds, in pores, and on rock fragments are few or common and faint or distinct.

Some pedons have a BC horizon. This horizon has colors and textures similar to those of the C horizon.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6. Texture of the fine-earth fraction is silt loam, loam, or silty clay loam.

Some pedons have a Cr layer.

Guyandotte Series

The Guyandotte series consists of very deep, well drained soils that formed in colluvium derived mostly from Pennsylvanian-age sedimentary deposits that are mostly sandstone but include shale and siltstone. Guyandotte soils are on mountain slopes, in coves, and on footslopes. Slopes range from 35 to 55 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Humudepts

Typical Pedon

Guyandotte very gravelly loam; Raleigh County, West Virginia; on a north-facing, 55 percent mountain slope in a forested area about 1.1 miles southwest of the intersection of State Routes 3 and 99, about 1.06 miles southeast of the confluence of Maple Meadow Creek and Marsh Fork; at an elevation of 652 meters (2,139 feet); lat. 37 degrees 46 minutes 17 seconds N. and long. 81 degrees 21 minutes 34 seconds W.; NAD83; Eccles, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; 5 percent nonflat subangular indurated sandstone stones; moderately acid, pH 5.7 by pH meter 1:1 water; very abrupt broken boundary.

A1—2 to 8 centimeters (1 to 3 inches); dark brown (10YR 3/3) (broken face and dry) very gravelly loam, very dark brown (10YR 2/2) (broken face and moist); 20 percent clay; weak fine granular structure; very friable, slightly sticky and slightly plastic; many fine to coarse roots throughout; 5 percent sandstone stones, 10 percent sandstone flagstones, and 40 percent sandstone gravel; very strongly acid, pH 5.0 by pH meter 1:1 water; abrupt smooth boundary.

A2—8 to 18 centimeters (3 to 7 inches); dark brown (10YR 3/3) (broken face and dry) very gravelly loam, very dark grayish brown (10YR 3/2) (broken face and moist); 21 percent clay; weak fine granular structure; very friable, slightly sticky and slightly plastic; many fine to coarse roots throughout; 4 percent sandstone stones, 6 percent sandstone flagstones, and 30 percent sandstone gravel; very strongly acid, pH 4.7 by pH meter 1:1 water; abrupt wavy boundary.

A3—18 to 31 centimeters (7 to 12 inches); dark yellowish brown (10YR 3/4) (broken face and dry) very gravelly loam, dark brown (10YR 3/3) (broken face and moist); 19 percent clay; moderate fine granular structure; very friable, slightly sticky and slightly plastic; many fine to coarse roots throughout; 4 percent sandstone stones, 6 percent sandstone flagstones, and 30 percent sandstone gravel; very strongly acid, pH 4.6 by pH meter 1:1 water; clear wavy boundary.

AB—31 to 46 centimeters (12 to 18 inches); dark yellowish brown (10YR 3/4) (broken face) very gravelly loam; 18 percent clay; weak fine subangular blocky structure; very friable, slightly sticky and slightly plastic; many fine to coarse roots throughout; 4 percent sandstone stones, 6 percent sandstone flagstones, and 45 percent sandstone gravel; very strongly acid, pH 4.9 by pH meter 1:1 water; clear wavy boundary.

Bw1—46 to 61 centimeters (18 to 24 inches); dark yellowish brown (10YR 4/6) (broken face) very gravelly loam; 17 percent clay; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine to coarse roots throughout; 4 percent sandstone stones, 6 percent sandstone flagstones, and 40 percent sandstone gravel; strongly acid, pH 5.2 by pH meter 1:1 water; gradual wavy boundary.

Bw2—61 to 140 centimeters (24 to 55 inches); yellowish brown (10YR 5/6) (broken face) very gravelly loam; 21 percent clay; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine to coarse roots throughout; 4 percent sandstone stones, 6 percent sandstone flagstones, and 40 percent sandstone gravel; very strongly acid, pH 4.9 by pH meter 1:1 water; gradual wavy boundary.

C—140 to 165 centimeters (55 to 65 inches); yellowish brown (10YR 5/6) (broken face) very gravelly loam; 19 percent clay; massive; firm, slightly sticky and slightly plastic; few fine roots around fragments; 10 percent sandstone stones, 15 percent sandstone flagstones, and 30 percent sandstone gravel; very strongly acid, pH 4.9 by pH meter 1:1 water.

Range in Characteristics

Solum thickness: 127 to 178 centimeters (50 to 70 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 15 to 70 percent in individual horizons but averaging 35 percent or more in the particle-size control section; gravel, channers, flagstones, and stones
Soil reaction: Very strongly acid to neutral in the A horizon and very strongly acid to moderately acid in the B and C horizons

The A horizon has hue of 10YR or 7.5YR, value of 2 or 3 (3 to 5 dry), and chroma of 1 to 3. Texture is sandy loam, loam, or silt loam.

The AB horizon (if it occurs) has hue of 10YR or 7.5YR and value and chroma of 3 or 4. Texture is sandy loam, loam, or silt loam.

The Bw horizon and, if they occur, the BA and BC horizons have hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. Texture is sandy loam, loam, or silt loam. Some pedons have thin discontinuous silt or clay films on the surface of rock fragments in the lower part of the B horizon.

The C horizon (if it occurs) has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Texture is loam, silt loam, or sandy loam.

Highsplint Series

The Highsplint series consists of very deep, well drained soils that formed in colluvium from interbedded lower Pennsylvanian-age and upper Mississippian-age shale and sandstone (fig. 32). Highsplint soils are on mountain slopes. Slopes range from 15 to 90 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Highsplint channery loam; Raleigh County, West Virginia; on a 66 percent slope in a forested area on Spruce Mountain, about 2.53 kilometers (1.57 miles) west-southwest on a bearing of 253 degrees from the intersection of the West Virginia Turnpike and

Figure 32.—Profile of Highsplint channery silt loam. Scale is in inches. Disoriented rock fragments indicate that this soil formed in colluvium, i.e., materials that have moved downslope. (Image is from Raleigh County, West Virginia.)

Clear Fork Road (County Route 1); at an elevation of 725 meters (2,380 feet); lat. 37 degrees 52 minutes 22.40 seconds N. and long. 81 degrees 17 minutes 40.85 seconds W.; NAD 83; Eccles, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 0.5 inch); slightly decomposed plant material.

Oe—2 to 4 centimeters (0.5 inch to 1.5 inches); moderately decomposed plant material.

A1—4 to 10 centimeters (1.5 to 4 inches); very dark grayish brown (10YR 3/2) channery loam; moderate fine granular structure; very friable; common fine, common medium, common coarse, common very coarse, and common very fine roots throughout; 30 percent unspecified fragments; moderately acid, pH 6.0 by pH meter 1:1 water; abrupt wavy boundary.

A2—10 to 22 centimeters (4 to 9 inches); dark brown (10YR 3/3) very channery loam; weak fine subangular blocky structure; very friable; common fine, common medium, common coarse, common very coarse, and common very fine roots throughout; 40 percent unspecified fragments; moderately acid, pH 5.7 by pH meter 1:1 water; clear irregular boundary.

BA—22 to 31 centimeters (9 to 12 inches); dark yellowish brown (10YR 4/4) very channery loam; weak fine and weak medium subangular blocky structure; friable; common fine, common medium, and common coarse roots throughout; 40 percent unspecified fragments; strongly acid, pH 5.3 by pH meter 1:1 water; clear wavy boundary.

Bw1—31 to 73 centimeters (12 to 29 inches); dark yellowish brown (10YR 4/6) very channery loam; weak medium subangular blocky structure; friable; common fine, common medium, and common coarse roots throughout; 45 percent unspecified fragments; strongly acid, pH 5.1 by pH meter 1:1 water; gradual wavy boundary.

Bw2—73 to 120 centimeters (29 to 47 inches); strong brown (7.5YR 5/6) very channery loam; weak medium subangular blocky structure; friable; common medium and common coarse roots throughout; 50 percent unspecified fragments; very strongly acid, pH 4.9 by pH meter 1:1 water; gradual wavy boundary.

BC—120 to 140 centimeters (47 to 55 inches); strong brown (7.5YR 5/6) extremely channery loam; weak fine and weak medium subangular blocky structure; friable; common fine and common medium roots throughout; 60 percent unspecified fragments; strongly acid, pH 5.1 by pH meter 1:1 water; gradual wavy boundary.

C—140 to 165 centimeters (55 to 65 inches); strong brown (7.5YR 5/6) extremely channery loam; massive; friable; common fine and common medium roots throughout; 80 percent unspecified fragments; strongly acid, pH 5.1 by pH meter 1:1 water.

Range in Characteristics

Solum thickness: 102 to 152 centimeters (40 to 60 inches) or more

Depth to bedrock: More than 152 centimeters (60 inches)

Rock fragments: 35 to 90 percent, by volume; mostly sandstone channers and flagstones; a few pedons, to a depth of about 24 inches, have horizons containing 15 to 35 percent rock fragments

Soil reaction: Extremely acid to slightly acid in the surface layer and extremely acid to strongly acid in the solum and substratum

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Some pedons have thin A horizons with value of 2 and chroma of 1. Texture of the fine-earth fraction is sandy loam, fine sandy loam, silt loam, or loam. Transitional horizons dominated by A horizon material share these properties. In a few pedons the A horizon meets depth requirements for mollic or umbric epipedon but does not meet dry color criteria.

The AB or BA horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. Texture of the fine-earth fraction is loam, silt loam, or silty clay loam.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Some pedons, below a depth of 40 inches, have lithochromic mottles or redoximorphic features in shades of brown, olive, or gray. Texture of the fine-earth fraction is loam, silt loam, clay loam, or silty clay loam. Silt content ranges from 35 to about 65 percent.

The BC horizon has colors and textures similar to those of the Bw horizon but commonly displays weak fragic properties believed to be the result of cementation from lateral water movement. The BC horizon also may have lithochromic mottles or redoximorphic features in shades of brown, olive, or gray below a depth of 40 inches.

The C or CB horizon (if it occurs) has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. Redoximorphic features in shades of brown, olive, or gray are common below a depth of 40 inches and generally increase in amount as depth increases. Texture of the fine-earth fraction is sandy loam, fine sandy loam, silt loam, silty clay loam, loam, or clay loam.

Itmann Series

The Itmann series consists of very deep, somewhat excessively drained soils that formed in regolith from the mining waste materials of Pennsylvanian-age coal. Slopes range from 0 to 70 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents

Typical Pedon

Itmann very channery sandy loam (fig. 33); Fayette County, West Virginia; on a 65 percent slope in a forested area above the National Park Service trail crossing Butchers Branch near Kaymoor; at an elevation of 584 meters (1,916 feet); lat. 38 degrees 02 minutes 51 seconds N. and long. 81 degrees 04 minutes 19 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 1 centimeter (0 to 0.5 inch); very dark brown (10YR 2/2) slightly decomposed plant material; clear wavy boundary.

A—1 to 6 centimeters (0.5 inch to 2 inches); dark gray (10YR 4/1) (broken face) very channery sandy loam; 10 percent clay; weak fine granular structure; friable; common fine and very fine roots throughout; many medium and common coarse moderate continuity tubular pores; 15 percent weakly cemented siltstone channers and 20 percent moderately cemented shale channers; slightly alkaline, pH 7.5 by Hellige-Truog; clear wavy boundary.

E/B—6 to 9 centimeters (2 to 4 inches); grayish brown (10YR 5/2) (broken face) channery sandy loam; 8 percent clay; weak medium subangular blocky structure parting to weak fine granular; very friable; many fine and common coarse and very coarse roots at the top of horizon; many medium and common coarse moderate continuity tubular pores; 10 percent moderately cemented shale channers and 10 percent weakly cemented siltstone channers; neutral, pH 6.7 by Hellige-Truog; abrupt wavy boundary.

C1—9 to 36 centimeters (4 to 14 inches); black (N 2.5/0) (broken face) extremely channery sandy loam; 6 percent clay; massive; very friable; common fine and very fine roots throughout; 2 percent moderately cemented shale flagstones, 3 percent moderately cemented sandstone gravel, 3 percent weakly cemented siltstone flagstones, 5 percent weakly cemented siltstone channers, 7 percent moderately cemented shale channers, 40 percent 5- to 100-millimeter siltstone fragments, and 5 percent very weakly cemented coal fragments; slightly alkaline, pH 7.5 by Hellige-Truog; clear irregular boundary.

Figure 33.—Profile of Itmann very channery sandy loam. Itmann soils formed in acid regolith from deep-mined coal spoil. These soils have limited acreage. Their high carbon (coal) content makes them a valuable resource. Many sites are being "remined" and the coal reprocessed.

C2—36 to 74 centimeters (14 to 29 inches); dark gray (N 4/0) (broken face) extremely channery sandy loam; 6 percent clay; massive; very friable; common very fine to medium roots around fragments; 4 percent moderately cemented sandstone gravel, 10 percent moderately cemented shale flagstones, 10 percent weakly cemented siltstone flagstones, 12 percent moderately cemented shale channers, 15 percent weakly cemented siltstone channers, and 32 percent very weakly cemented coal fragments; slightly alkaline, pH 7.5 by Hellige-Truog; gradual irregular boundary.

C3—74 to 90 centimeters (29 to 35 inches); black (N 2.5/0) (broken face) extremely channery sandy loam; 6 percent clay; massive; very friable; common fine and very fine roots around fragments; 2 percent moderately cemented shale flagstones, 3 percent moderately cemented sandstone gravel, 5 percent moderately cemented shale channers, 6 percent weakly cemented siltstone flagstones, 12 percent weakly cemented siltstone channers, and 42 percent very weakly cemented coal fragments; slightly alkaline, pH 7.5 by Hellige-Truog; clear irregular boundary.

C4—90 to 120 centimeters (35 to 47 inches); dark gray (N 4/0) (broken face) extremely channery sandy loam; 6 percent clay; massive; very friable; many fine roots throughout and common medium and coarse roots around fragments; 4 percent moderately cemented sandstone gravel, 6 percent weakly cemented siltstone flagstones, 8 percent moderately cemented shale flagstones, 10 percent moderately cemented shale channers, 25 percent weakly cemented siltstone channers, and 27 percent very weakly cemented coal fragments; slightly alkaline, pH 7.5 by Hellige-Truog.

Range in Characteristics

Thickness of solum (A and E/B horizons): 13 to 25 centimeters (5 to 10 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 15 to 80 percent throughout the profile but averaging 35 percent or more in the particle-size control section; channers of carbolithic materials, siltstone, sandstone, and shale; carbolithic fragments constitute more than 50 percent of the total rock fragments
Soil reaction: Moderately acid to slightly alkaline

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is sandy loam or loam. The A horizon of some pedons was formed by stockpiling natural topsoil and spreading it over the land surface. In these pedons, the A horizon is 6 to 20 inches thick, has value of 4 to 6 and chroma of 4 to 8, and is clay loam or silty clay loam in the fine-earth fraction.

Some pedons have developed an E or E/B horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. Texture is sandy loam or loam.

The C horizon has hue of 10YR, value of 2 to 3, and chroma of 1 or 2. It has lithochromic mottles in most pedons. Texture is sandy loam or loam, and thin layers or pockets of loamy sand are included.

The Itmann soils in New River Gorge National River are considered a taxadjunct to the series because they typically are less acid than what is allowed by the series. This difference, however, does not significantly affect the use and management of the soils.

Kaymine Series

The Kaymine series consists of very deep, well drained soils that formed in nonacid regolith from the surface mining of Pennsylvanian-age coal (fig. 34). The regolith is a mixture of partially weathered fine earth and bedrock fragments. Slopes range from 0 to 60 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents

Typical Pedon

Kaymine extremely channery loam in an area of Kaymine-Rock outcrop complex, very steep; Greenbrier County, West Virginia; on an outslope that has been revegetated with crown vetch and orchardgrass, about 4.2 kilometers (2.6 miles) north and 10 degrees west of Charmco; at an elevation of 896 meters (2,940 feet); lat. 38 degrees 02 minutes 25 seconds N. and long. 80 degrees 45 minutes 07 seconds W.; NAD83; Corliss, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Figure 34.—Profile of Kaymine very channery loam. Kaymine soils formed on sites of reclaimed nonacid surface mines. A large quantity of rock and coal fragments occurs throughout the profile.

A—0 to 13 centimeters (0 to 5 inches); very dark grayish brown (10YR 3/2) (broken face) extremely channery loam; weak very fine granular structure; very friable; many very fine to coarse roots throughout; 80 percent channers; slightly acid, pH 6.3 by Hellige-Truog; clear broken boundary.

AC—13 to 33 centimeters (5 to 13 inches); dark grayish brown (10YR 4/2) (broken face) extremely channery loam; weak fine subangular blocky structure; friable;

many very fine to coarse roots throughout; 70 percent channers; neutral, pH 6.8; clear broken boundary.

C1—33 to 91 centimeters (13 to 36 inches); dark grayish brown (10YR 4/2) (broken face) very channery loam; massive; friable; common very fine to coarse roots throughout; 60 percent channers; neutral, pH 6.8 by Hellige–Truog; clear wavy boundary.

C2—91 to 165 centimeters (36 to 65 inches); dark grayish brown (10YR 4/2) (broken face) extremely channery loam; massive; friable; few coarse roots throughout; 80 percent channers; neutral, pH 6.8 by Hellige-Truog.

Range in Characteristics

Depth to bedrock: More than 152 centimeters (60 inches)

Rock fragments: 15 to 80 percent, by volume, throughout the profile but averaging 35 percent or more in the particle-size control section; siltstone, shale, sandstone, and coal; each type of fragment makes up less than 65 percent, by volume, of the total rock fragments in the control section

Soil reaction: Moderately acid to slightly alkaline

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 0 to 4. Texture is sandy loam or loam.

Some pedons have developed an AC horizon. This horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 4. Texture is sandy loam, silt loam, or loam.

The C horizon has hue of 7.5YR or 10YR, value of 2 to 6, and chroma of 1 to 8. In most pedons, it has lithochromic mottles. Texture is silt loam or loam, and thin layers or pockets of loamy sand are included.

Knowlton Series

The Knowlton series consists of very deep, poorly drained soils that formed in alluvium from interbedded Mississippian-age shale, sandstone, and siltstone. Knowlton soils are on low terraces in mountain valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, mixed, semiactive, mesic Typic Endoaquults

Typical Pedon

Knowlton loam; Fayette County, West Virginia; on a 2 percent slope in a forested area east of Craig Branch near Kaymoor; at an elevation of 584 meters (1,916 feet); lat. 38 degrees 02 minutes 25 seconds N. and long. 81 degrees 02 minutes 51 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oe—0 to 2 centimeters (0 to 1 inch); very dark brown (7.5YR 2.5/2) (rubbed) moderately decomposed plant material; abrupt smooth boundary.

A—2 to 8 centimeters (1 to 3 inches); very dark grayish brown (10YR 3/2) (broken face) loam; moderate medium granular and moderate fine granular structure; very friable; strongly acid, pH 4.9 by Hellige-Truog; clear smooth boundary.

E—8 to 25 centimeters (3 to 10 inches); grayish brown (2.5Y 5/2) (broken face) loam; moderate medium subangular blocky structure; friable; 15 percent fine strong brown (7.5YR 4/6) masses of oxidized iron on surfaces along root channels; very strongly acid, pH 4.7 by Hellige-Truog; clear smooth boundary.

BEg—25 to 43 centimeters (10 to 17 inches); light brownish gray (2.5Y 6/2) (broken face) loam; 14 percent clay; moderate medium subangular blocky structure;

friable; 15 percent fine strong brown (7.5YR 5/6) masses of oxidized iron on surfaces along root channels and 25 percent medium light yellowish brown (10YR 6/4) masses of oxidized iron infused into matrix along faces of peds; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Btg1—43 to 56 centimeters (17 to 22 inches); light brownish gray (2.5Y 6/2) (broken face) loam; 20 percent clay; weak very coarse prismatic structure parting to moderate medium subangular blocky; friable, slightly sticky and slightly plastic; 15 percent discontinuous faint clay films on vertical faces of peds; 20 percent coarse strong brown (7.5YR 5/6) masses of oxidized iron infused into matrix along faces of peds; very strongly acid, pH 4.5 by Hellige-Truog; gradual wavy boundary.

Btg2—56 to 165 centimeters (22 to 65 inches); light gray (2.5Y 7/2) (broken face) loam; 22 percent clay; weak very coarse prismatic structure parting to moderate coarse subangular blocky; friable, slightly sticky and slightly plastic; 25 percent continuous faint clay films on vertical faces of peds; 25 percent coarse strong brown (7.5YR 5/6) masses of oxidized iron infused into matrix along faces of peds; very strongly acid, pH 4.5 by Hellige-Truog.

Range in Characteristics

Solum thickness: 102 to 152 centimeters (30 to 60 inches) or more
Depth to bedrock: More than 165 centimeters (65 inches)
Rock fragments: 0 to 15 percent throughout the profile; mostly rounded sandstone gravel
Soil reaction: Strongly acid to neutral in the surface layer and very strongly acid to moderately acid in the subsoil

The A horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. Texture is silt loam or loam.

The E horizon (if it occurs) has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is silt loam or loam.

The BE horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Texture is silt loam, loam, silty clay loam, or clay loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It commonly has soft iron masses in shades of yellow, red, or brown. Texture is silt loam, silty clay loam, clay loam, or, less commonly, loam.

The CBg or Cg horizon (if it occurs) is neutral in hue or has hue of 7.5YR to 5Y, has value of 1 to 7, and has chroma of 1 to 4. It commonly has soft iron masses in shades of yellow, red, or brown. Texture is silt loam, silty clay loam, clay loam, or, less commonly, loam.

The Knowlton soils in New River Gorge National River are considered a taxadjunct to the series because they typically have a fine-loamy particle size class. This is due to the presence of more sand and less silt in the subsoil control section. This difference, however, does not significantly affect the use and management of the soils.

Laidig Series

The Laidig series consists of very deep, well drained soils that formed in colluvium from Pennsylvanian-age acid sandstone or interbedded sandstone, siltstone, and shale (figs. 35 and 36). Laidig soils are on mountain footslopes and benches. Slopes range from 3 to 35 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults

Figure 35.—Profile of Laidig silt loam. Scale is in centimeters. A fragipan (a dense subsurface horizon that restricts water flow and root penetration) begins at a depth of about 120 centimeters (47 inches). (Image is from Fayette County, West Virginia.)

Typical Pedon

Laidig highly organic silt loam; Fayette County, West Virginia; on an 18 percent slope in a forested area in an old road cut on the south side of Miner's Trail at the top of a National Park Service road, approximately 692 meters (2,270 feet) southeast of the town of Cunard; at an elevation of 486 meters (1,594 feet); lat. 38 degrees 00 minutes

02 seconds N. and long. 81 degrees 01 minute 58 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; abrupt wavy boundary.

A—2 to 9 centimeters (1 to 4 inches); very dark grayish brown (10YR 3/2) (crushed) highly organic silt loam; weak fine granular structure; very friable; common very fine to coarse roots throughout; 10 percent sandstone gravel; extremely acid, pH 4.2 by 1:1 water; clear wavy boundary.

A/B—9 to 19 centimeters (4 to 7 inches); 40 percent yellowish brown (10YR 5/6) and 60 percent dark grayish brown (10YR 4/2) (crushed) silt loam; weak medium and fine granular structure throughout; very friable; common very fine to coarse roots throughout; 10 percent sandstone gravel; extremely acid, pH 4.3 by 1:1 water; gradual wavy boundary.

Bt1—19 to 35 centimeters (7 to 14 inches); yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) (broken face) silt loam; weak medium subangular blocky and weak fine subangular blocky structure; friable; common fine and medium roots throughout; 5 percent patchy faint clay films on vertical faces of peds; 10 percent sandstone gravel; very strongly acid, pH 4.5 by 1:1 water; gradual wavy boundary.

Bt2—35 to 80 centimeters (14 to 31 inches); dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) (broken face) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots throughout; 25 percent discontinuous faint clay films on vertical faces of peds; 10 percent sandstone gravel; very strongly acid, pH 4.7 by 1:1 water; gradual wavy boundary.

Figure 36.—Image of a Laidig soil showing gray areas (zones of iron depletion) and reddish areas (zones of oxidized iron concentrations) along structural prism faces in the fragipan layer. These features are indicative of how slowly water passes through this layer of the soil.

Bt3—80 to 112 centimeters (31 to 44 inches); dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) (broken face) gravelly silt loam; weak medium subangular blocky structure; friable; common fine and medium roots throughout; 15 percent discontinuous faint clay films on vertical faces of peds; 30 percent sandstone gravel; very strongly acid, pH 4.6 by 1:1 water; clear wavy boundary.

Bt4—112 to 122 centimeters (44 to 48 inches); yellowish brown (10YR 5/6) (broken face) gravelly silt loam; weak medium platy structure; firm; common fine roots throughout; 10 percent patchy faint clay films on vertical faces of peds; 15 percent fine and medium light brownish gray (10YR 6/2) iron depletions on faces of peds; 15 percent fine and medium strong brown (7.5YR 4/6) masses of oxidized iron in matrix surrounding redoximorphic depletions; 30 percent sandstone gravel; very strongly acid, pH 4.6 by 1:1 water; gradual wavy boundary.

Btx—122 to 180 centimeters (48 to 71 inches); yellowish brown (10YR 5/6) (broken face) very gravelly loam; weak very coarse prismatic structure structure; very firm; 1 percent patchy faint clay films on vertical faces of peds; 1 percent fine and medium light brownish gray (10YR 6/2) iron depletions on vertical faces of peds and 1 percent fine and medium strong brown (7.5YR 4/6) masses of oxidized iron infused into matrix along faces of peds; 40 percent sandstone gravel; very strongly acid, pH 4.8 by 1:1 water.

Range in Characteristics

Solum thickness: 127 to 203 centimeters (50 to 80 inches)

Depth to bedrock: More than 152 centimeters (60 inches)

Rock fragment content: Average of less than 35 percent in the particle-size control section; 5 to 50 percent in individual subhorizons of the A, E, BE, BA, and Bt horizons; 15 to 70 percent in individual subhorizons of the Btx horizon; 20 to 70 percent in the C horizon

Soil reaction: Extremely acid to strongly acid throughout the profile in unlimed areas

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 4. The Ap horizon (if it occurs) has chroma of 2 to 8. Texture of the fine-earth fraction is loam, sandy loam, fine sandy loam, or silt loam.

The E horizon (if it occurs) has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 6. Texture of the fine-earth fraction is loam, fine sandy loam, sandy loam, or, less commonly, silt loam.

Some pedons have an AB horizon. This horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture of the fine-earth fraction is loam, sandy loam, fine sandy loam, or silt loam.

The BE horizon (if it occurs) has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. Texture of the fine-earth fraction is loam, fine sandy loam, sandy loam, or silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. Subhorizons immediately above the Btx horizon may have hue of 5YR. The Bt horizon may have redoximorphic features at a depth of 30 inches or more. Texture of the fine-earth fraction is loam, sandy clay loam, clay loam, fine sandy loam, sandy loam, or silt loam. The horizon has weak or moderate, fine or medium subangular blocky structure.

The Btx horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. It has high- and low-chroma redoximorphic features. Texture of the fine-earth fraction is fine sandy loam, sandy loam, loam, sandy clay loam, clay loam, or silt loam. The horizon has weak very coarse prismatic structure parting to platy or subangular blocky.

The C horizon (if it occurs) has hue of 5YR to 10YR, value of 5 or 6, and chroma of 3 to 8. It has high- and low-chroma redoximorphic features. Texture of the fine-earth fraction is fine sandy loam, sandy loam, loam, sandy clay loam, clay loam, or silt loam.

The Laidig soils in New River Gorge National River are a taxadjunct to the series because they typically have a semiactive cation-exchange activity class. This is due to the dominance of low-activity clay minerals in the subsoil. This difference, however, does not significantly affect the use and management of the soils.

Layland Series

The Layland series consists of very deep, well drained soils that formed in colluvium derived from Pennsylvanian-age acid sandstone and shale (New River Formation). Layland soils are on mountain slopes and footslopes. Slopes range from 15 to 70 percent. The mean annual precipitation is about 1,207 millimeters (47.5 inches), and the mean annual temperature is about 10.6 degrees C (51 degrees F).

Taxonomic Classification

Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts

Typical Pedon

Layland cobbly silt loam (fig. 37) in an area of Layland-Rock outcrop complex; Nicholas County, West Virginia; on a 49 percent slope in a forested area about 1,207 meters (3,960 feet) east of the confluence of Collison Creek and the Gauley River; at an elevation of 424 meters (1,391 feet); lat. 38 degrees 12 minutes 13 seconds N. and long. 80 degrees 54 minutes 49 seconds W.; NAD83; Summersville Dam, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A1—0 to 5 centimeters (0 to 2 inches); very dark grayish brown (10YR 3/2) (broken face) cobbly silt loam; moderate fine and medium granular structure; very friable; common fine and medium, few coarse, and many very fine roots; 10 percent nonflat subangular sandstone gravel and 20 percent nonflat subangular sandstone cobbles; very strongly acid, pH 4.8 by Hellige-Truog; abrupt wavy boundary.

A2—5 to 20 centimeters (2 to 8 inches); dark brown (10YR 3/3) (broken face) very stony silt loam; moderate fine and medium granular structure; very friable; common coarse, few very coarse, and common very fine to medium roots; 15 percent flat subangular sandstone channers and 30 percent nonflat subangular sandstone stones; very strongly acid, pH 4.8 by Hellige-Truog; clear wavy boundary.

BA—20 to 40 centimeters (8 to 16 inches); brown (10YR 4/3) (broken face) stony silt loam; weak medium granular structure; very friable; common fine to coarse and few very fine roots; 15 percent nonflat subangular sandstone gravel and 25 percent nonflat subangular sandstone stones; very strongly acid, pH 4.7 by Hellige-Truog; clear wavy boundary.

Bw1—40 to 50 centimeters (16 to 20 inches); dark yellowish brown (10YR 4/6) (broken face) very cobbly silt loam; 24 percent clay; moderate medium subangular blocky structure; friable; few very fine and fine and common medium roots; 10 percent flat subangular sandstone channers, 10 percent nonflat subangular sandstone stones, and 20 percent nonflat subangular sandstone cobbles; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

Bw2—50 to 111 centimeters (20 to 44 inches); yellowish brown (10YR 5/4) (broken face) very stony loam; 26 percent clay; moderate fine and medium subangular blocky structure; friable; few fine roots; 10 percent flat subangular sandstone stones, 15 percent flat subangular sandstone channers, and 20 percent flat subangular sandstone flagstones; very strongly acid, pH 4.9 by Hellige-Truog; gradual wavy boundary.

Bw3—111 to 142 centimeters (44 to 56 inches); yellowish brown (10YR 5/4) (broken face) very channery clay loam; 28 percent clay; weak medium subangular blocky

Figure 37.—Profile of Layland cobbly silt loam. Disoriented rock fragments indicate that this soil formed in colluvium.

structure; friable; 5 percent flat subangular sandstone stones, 10 percent flat subangular sandstone flagstones, and 20 percent flat subangular sandstone channers; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

BC—142 to 200 centimeters (56 to 79 inches); yellowish brown (10YR 5/4) (broken face) very stony loam; 24 percent clay; weak coarse subangular blocky structure; firm; 2 percent fine distinct light brownish gray (10YR 6/2) and 8 percent fine faint brown (10YR 5/3) iron depletions infused into matrix along faces of peds; 12 percent medium faint dark yellowish brown (10YR 4/6) masses of oxidized iron in matrix surrounding redoximorphic depletions; 5 percent flat subangular sandstone flagstones, 15 percent flat subangular sandstone stones, and 20 percent flat subangular sandstone channers; very strongly acid, pH 4.8 by Hellige-Truog.

Range in Characteristics

Solum thickness: 72 to 200 centimeters (30 to 79 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 5 to 60 percent, by volume, in the solum, and 30 to 90 percent in the BC and C horizons; dominantly sandstone in the upper part of the profile; fragments of siltstone and shale commonly increase in volume as depth increases
Soil reaction: Very strongly acid or extremely acid

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 1 to 4. Texture of the mineral fine-earth fraction is loam or silt loam.

The BA horizon (or a similar transitional horizon) has hue of 7.5YR to 2.5Y, value of 3 to 6 (6 or more dry), and chroma of 3 to 6. Texture of the fine-earth fraction is loam or silt loam.

The E horizon (or transitional eluvial horizon), if it occurs, has hue of 10YR to 2.5Y, value of 4 to 6 (6 or more dry), and chroma of 2 to 6. Texture of the fine-earth fraction is loam or silt loam.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture of the fine-earth fraction is loam, silt loam, or clay loam.

The BC or 2BC horizon has hue of 7.5YR to 2.5Y and value and chroma of 4 to 8. Texture of the fine-earth fraction is loam, silt loam, clay loam, or silty clay loam.

The C or 2C horizon (if it occurs) has hue of 7.5YR to 2.5Y and value and chroma of 4 to 8. Texture of the fine-earth fraction is loam, silt loam, clay loam, or silty clay loam.

Lily Series

The Lily series consists of moderately deep, well drained soils that formed in residuum primarily from the Bluestone Formation (Mississippian-age) sandstone. Lily soils are on mountain ridges and structural benches. Slopes range from 3 to 15 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Fine-loamy, siliceous, semiactive, mesic Typic Hapludults

Typical Pedon

Lily loam (fig. 38); Summers County, West Virginia; on a 9 percent slope in a forested area on Hump Mountain, about 800 meters (0.5 mile) southwest of Sandstone Road and 1,500 meters (0.93 mile) east of the community of Meadow Creek; at an elevation of 710 meters (2,329 feet); lat. 37 degrees 48 minutes 06 seconds N. and long. 80 degrees 54 minutes 13 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; very abrupt broken boundary.
Oe—2 to 5 centimeters (1 to 2 inches); moderately decomposed plant material; abrupt wavy boundary.
A—5 to 11 centimeters (2 to 4 inches); very dark grayish brown (10YR 3/2) (broken face) loam; moderate fine and medium granular structure; very strongly acid, pH 4.5 by Hellige–Truog; abrupt wavy boundary.
B/A—11 to 19 centimeters (4 to 7 inches); 50 percent very dark grayish brown (10YR 3/2) and 50 percent yellowish brown (10YR 5/4) (broken face) loam; weak fine and

Figure 38.—Profile of Lily loam. Depth is marked in centimeters. Because this soil formed under forest, it exhibits dark surface horizons 5 centimeters (2 inches) thick. Lily soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, sandstone bedrock is at a depth of approximately 65 centimeters (26 inches). (Image is from Lincoln County, West Virginia.)

medium subangular blocky structure; very strongly acid, pH 4.5 by Hellige–Truog; abrupt wavy boundary.

Bt1—19 to 54 centimeters (7 to 21 inches); yellowish brown (10YR 5/4) (broken face) loam; 19 percent clay; moderate medium subangular blocky structure; very strongly acid, pH 4.7 by Hellige–Truog; clear wavy boundary.

Bt2—54 to 88 centimeters (21 to 35 inches); strong brown (7.5YR 5/6) (broken face) gravelly loam; 22 percent clay; moderate medium subangular blocky structure; 20 percent sandstone gravel; very strongly acid, pH 4.7 by Hellige–Truog; gradual wavy boundary.

C—88 to 99 centimeters (35 to 39 inches); 20 percent brownish yellow (10YR 6/6) and 80 percent strong brown (7.5YR 5/8) (broken face) sandy loam; 16 percent clay; massive; very strongly acid, pH 4.6 by Hellige–Truog; very abrupt wavy boundary.

R—99 to 109 centimeters (39 to 43 inches); indurated sandstone bedrock; very high excavation difficulty.

Range in Characteristics

Solum thickness: 51 to 102 centimeters (20 to 40 inches)
Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)

Rock fragments: 0 to 30 percent above a depth of about 24 inches and 0 to 35 percent below a depth of 24 inches; mostly sandstone channers
Soil reaction: Extremely acid to strongly acid, except in limed areas

The Ap horizon (if it occurs) has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. Texture is loam, silt loam, fine sandy loam, or sandy loam.

The A horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 1 to 3. Texture is loam, silt loam, fine sandy loam, or sandy loam.

Transitional horizons, such as AB, BA, and BE horizons, may occur. These horizons have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 1 to 8. Texture is loam, fine sandy loam, or sandy loam.

The E horizon (if it occurs) has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. Texture is loam, silt loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 4 to 8. Lithochromic mottles in shades of red, brown, or yellow become more common as depth increases. Texture is loam, sandy clay loam, or clay loam. Subhorizons of fine sandy loam are in the lower part of some pedons.

The BC horizon and the C horizon (if it occurs) have hue of 10YR to 2.5YR, value of 4 to 6, and chroma of 4 to 8. Texture is loamy sand, sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam.

Lithic Hapludolls

Lithic Hapludolls are shallow, well drained soils that formed in gravelly alluvium derived from interbedded sedimentary rock (fig. 39). These soils are on rarely flooded terraces in river valleys (fig. 40). Slopes range from 0 to 3 percent. The mean annual

Figure 39.—Lithic Hapludolls were formed when alluvium was washed into and out of the void spaces in the sandstone along the New River. These soils are of very limited extent in the survey area and occur primarily in Sandstone Falls State Park.

Figure 40.—Representative landscape for Lithic Hapludolls–Rock outcrop complex, 0 to 3 percent slopes, rubbly, rarely flooded. Lithic Hapludolls formed when alluvium was washed into void spaces in rock outcrops along the New River. This map unit is the location for the Appalachian Flatrock Community Ecosystem. This community contains many plants that grow nowhere else in the park.

precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Loamy-skeletal, mixed, active, mesic Lithic Hapludolls

Typical Pedon

Lithic Hapludolls; Raleigh County, West Virginia; on a 1 percent slope under a cover of trees in Sandstone Falls State Park, about 23 meters (75 feet) east of the boardwalk; at an elevation of 396 meters (1,300 feet); lat. 37 degrees 45 minutes 34 seconds N. and long. 80 degrees 54 minutes 15 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A1—0 to 20 centimeters (0 to 8 inches); brown (7.5YR 4/2) (dry) and very dark brown (7.5YR 2.5/2) (crushed) cobbly loam; weak fine granular structure; very friable; 20 percent sandstone cobbles; slightly acid, pH 6.5 by Hellige–Truog; clear wavy boundary.

A2—20 to 38 centimeters (8 to 15 inches); brown (7.5YR 5/3) (dry) and dark brown (7.5YR 3/2) (crushed) very cobbly loam; weak medium subangular blocky structure parting to weak fine granular; very friable; 50 percent sandstone cobbles; moderately acid, pH 6.1 by Hellige–Truog; clear wavy boundary.

C—38 to 46 centimeters (15 to 18 inches); dark brown (7.5YR 3/3) (broken face) extremely cobbly loam; massive; friable; 65 percent sandstone cobbles; moderately acid, pH 6.1 by Hellige–Truog; abrupt irregular boundary.
R—46 to 56 centimeters (18 to 22 inches); sandstone bedrock.

Range in Characteristics

Solum (A horizon) thickness: 20 to 25 centimeters (8 to 10 inches)
Depth to bedrock: Less than 50 centimeters (20 inches)
Rock fragments: 20 to 50 percent sandstone cobbles in the A horizon and more than 60 percent sandstone cobbles and stones in the C horizon

The A horizon has hue of 7.5YR, value of 2.5 or 3, and chroma of 1 or 2. Texture is loam or sandy loam.

The C horizon has hue of 7.5YR, value of 3 or 4, and chroma of 2 to 4. Texture is loam or sandy loam.

Lithic Udorthents

Lithic Udorthents are shallow, somewhat excessively drained soils. They formed in areas that have been disturbed by excavation, grading, cutting, filling, or a combination of these activities. The parent material is highly variable but generally consists of a mixture of native soil material over sandstone or shale primarily from Pennsylvanian-age or Mississippian-age sedimentary rock. Slopes range from 0 to 100 percent. The mean annual precipitation is about 1,004 millimeters (37.8 inches), and the mean annual temperature is about 10.2 degrees C (50.4 degrees F).

Taxonomic Classification

Mesic Lithic Udorthents

Typical Pedon

Lithic Udorthents; Nicholas County, West Virginia; on a 1 percent slope within the Summersville Dam spillway, about 1,127 meters (3,696 feet) southwest of the entrance to the roadside park and 322 meters (1,056 feet) southeast of the entrance to Battle Run Campground; at an elevation of 513 meters (1,683 feet); lat. 38 degrees 12 minutes 56 seconds N. and long. 80 degrees 54 minutes 19 seconds W.; NAD83; Summersville Dam, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A—0 to 10 centimeters (0 to 4 inches); dark brown (10YR 3/3) (crushed) very gravelly loam; weak medium and fine granular structure; friable; 1 percent very strongly cemented sandstone stones and 40 percent strongly cemented sandstone gravel; very strongly acid; gradual wavy boundary.
C—10 to 22 centimeters (4 to 9 inches); brownish yellow (10YR 6/6) (crushed) extremely gravelly sandy loam; massive; friable; 65 percent strongly cemented sandstone gravel; extremely acid; abrupt smooth boundary.
R—22 to 23 centimeters (9 inches); indurated sandstone bedrock; very high excavation difficulty.

Range in Characteristics

Solum thickness: Less than 51 centimeters (20 inches)
Depth to bedrock: Less than 51 centimeters (20 inches)
Rock fragment content: Variable; typically more than 35 percent throughout the profile
Soil reaction: Variable, depending on the nature of the parent lithology

Nallen Series

The Nallen series consists of moderately deep, well drained soils that formed in residuum weathered from Pennsylvanian-age sandstone. Nallen soils are on broad mountain ridges. Slopes range from 3 to 25 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults

Typical Pedon

Nallen loam (fig. 41); Fayette County, West Virginia; in a forested area on a 9 percent slope on a ridge on the edge of the Meadow River Gorge, about 610 meters (2,000 feet) southeast of the U.S. Route 19 bridge over the Meadow River; at an elevation of 558 meters (1,831 feet); lat. 38 degrees 08 minutes 45 seconds N. and long. 80 degrees 55 minutes 31 seconds W.; NAD83; Summersville Dam, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; abrupt wavy boundary.

A—2 to 15 centimeters (1 to 6 inches); very dark grayish brown (10YR 3/2) (broken face) loam; 8 percent clay; moderate medium granular structure; very friable; 5 percent moderately cemented and 5 percent very strongly cemented sandstone gravel; very strongly acid, pH 4.5 by Hellige-Truog; abrupt smooth boundary.

B/A—15 to 23 centimeters (6 to 9 inches); 40 percent dark brown (10YR 3/3) and 60 percent yellowish brown (10YR 5/4) (broken face) gravelly loam; 10 percent clay; weak medium subangular blocky structure; friable; 10 percent moderately cemented and 10 percent very strongly cemented sandstone gravel; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

Bt—23 to 53 centimeters (9 to 21 inches); yellowish brown (10YR 5/6) (broken face) gravelly loam; 16 percent clay; moderate medium subangular blocky structure; friable; 10 percent patchy faint clay films on surfaces along pores; 10 percent very strongly cemented and 10 percent moderately cemented sandstone gravel; very strongly acid, pH 4.5 by Hellige-Truog; clear wavy boundary.

BC—53 to 67 centimeters (21 to 26 inches); yellowish brown (10YR 5/6) (broken face) gravelly loam; 14 percent clay; weak coarse subangular blocky structure; friable; 10 percent very strongly cemented and 15 percent moderately cemented sandstone gravel; extremely acid, pH 4.4 by Hellige-Truog; abrupt wavy boundary.

R—67 to 77 centimeters (26 to 30 inches); indurated sandstone bedrock; very high excavation difficulty.

Range in Characteristics

Solum thickness: 23 to 102 centimeters (9 to 40 inches)

Depth to bedrock: 51 to 102 centimeters (20 to 40 inches)

Rock fragment content: 0 to 15 percent in the upper part of the solum and 5 to 50 percent in the BC and C horizons

Soil reaction: Very strongly acid to extremely acid throughout the profile, except in areas that have been limed or affected by burning

The A horizon or Ap horizon (if it occurs) has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4. Texture is silt loam, loam, fine sandy loam, or sandy loam.

The BA horizon (or a similar transitional horizon), if it occurs, has hue of 7.5YR to 2.5Y, value of 3 to 6 (6 or more dry), and chroma of 3 to 6. Texture is silt loam, loam, fine sandy loam, or sandy loam.

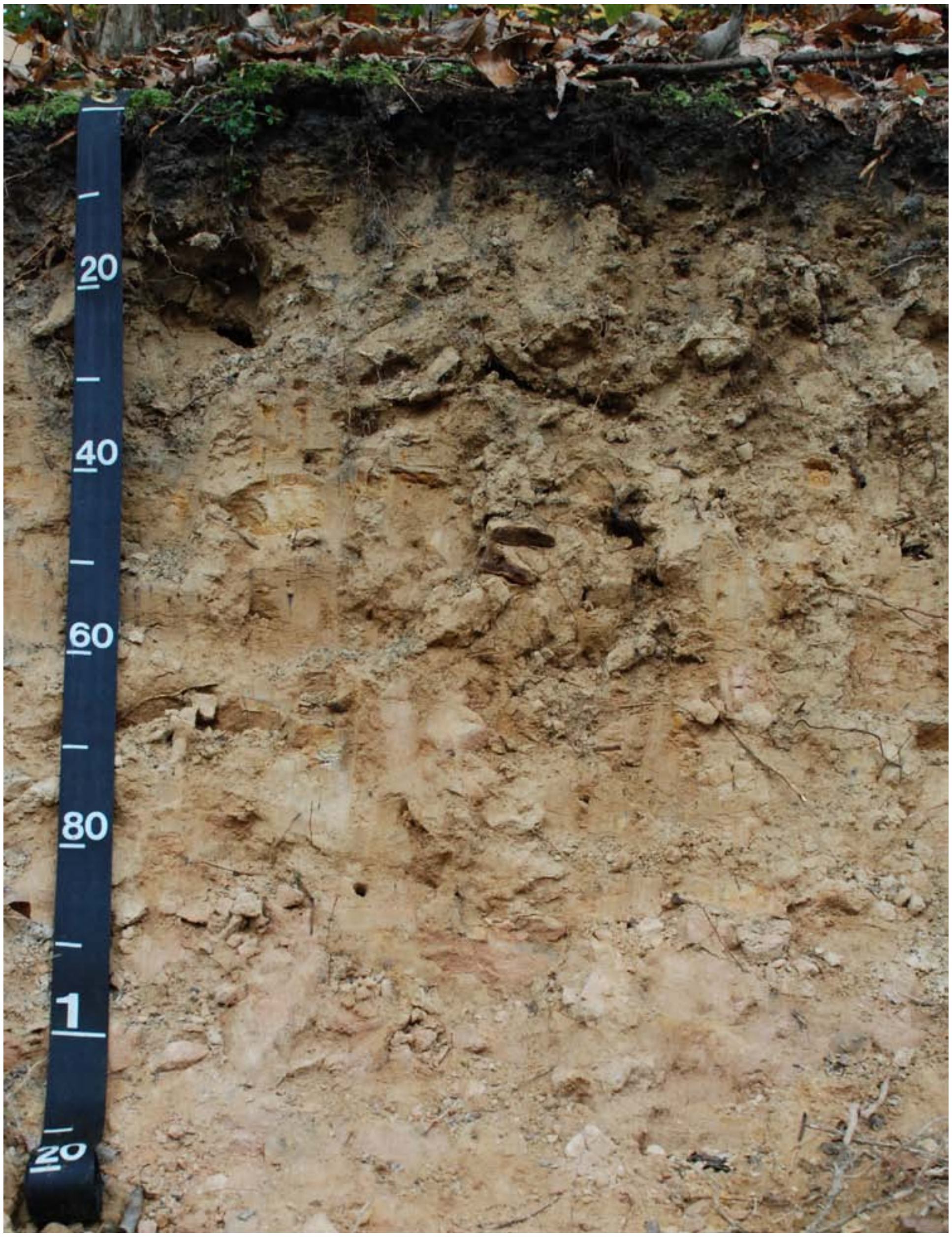


Figure 41.—Profile of Nallen loam in a forested area. Scale is in centimeters. Nallen soils have bedrock at a depth of 51 to 102 centimeters (20 to 40 inches). In this photo, weathered sandstone bedrock begins at a depth of about 90 centimeters (35 inches).

The E horizon (if it occurs) has hue of 10YR to 2.5Y, value of 4 to 6 (6 or more dry), and chroma of 2 to 6. Texture is silt loam, loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture is loam, fine sandy loam, or sandy loam.

The BC horizon or CB horizon (if it occurs) has hue of 7.5YR to 2.5Y and value and chroma of 4 to 8. Texture is loam, fine sandy loam, or sandy loam.

The C horizon (if it occurs) has hue of 7.5YR to 2.5Y and value and chroma of 4 to 8. Texture is loam, fine sandy loam, sandy loam, or loamy sand. The horizon may have lithochromic features in shades of yellow and reddish brown.

Nelse Series

The Nelse series consists of very deep, well drained soils that formed in recent alluvium of primarily Mississippian-age sandstone, siltstone, shale, and a minor component of coal. Nelse soils are on high-energy flood plains in river valleys. Slopes range from 0 to 5 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Sandy, mixed, active, nonacid, mesic Mollic Udifluvents

Typical Pedon

Nelse sandy loam (fig. 42); Raleigh County, West Virginia; on a 2 percent slope on a forested flood plain of the New River, just downstream from Sandstone Falls, approximately 268 meters (880 feet) southeast of the parking area at Sandstone Falls State Park; at an elevation of 390 meters (1,279 feet); lat. 37 degrees 45 minutes 26 seconds N. and long. 80 degrees 54 minutes 13 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A1—0 to 10 centimeters (0 to 4 inches); very dark grayish brown (10YR 3/2) (crushed and dry) sandy loam, black (10YR 2/1) (crushed and moist); weak medium granular structure; very friable, common very fine and fine roots; slightly acid, pH 6.3 by Hellige-Truog; clear smooth boundary.

A2—10 to 30 centimeters (4 to 12 inches); dark brown (10YR 3/3) (crushed and dry) sandy loam, brown (10YR 5/3) (crushed and moist); weak medium granular structure; very friable; common fine roots; slightly acid, pH 6.5 by Hellige-Truog; clear smooth boundary.

C1—30 to 46 centimeters (12 to 18 inches); dark yellowish brown (10YR 4/6) (crushed) loamy sand; single grain; very friable; slightly acid, pH 6.5 by Hellige-Truog; clear wavy boundary.

C2—46 to 74 centimeters (18 to 29 inches); yellowish brown (10YR 5/6) (crushed) loamy sand; single grain; very friable; slightly acid, pH 6.5 by Hellige-Truog; gradual wavy boundary.

C3—74 to 100 centimeters (29 to 39 inches); dark yellowish brown (10YR 4/6) (crushed) sand; single grain; loose; slightly acid, pH 6.5 by Hellige-Truog; gradual wavy boundary.

C4—100 to 200 centimeters (39 to 79 inches); strong brown (7.5YR 4/6) (crushed) sand; single grain; loose; 2 percent sandstone gravel; slightly acid, pH 6.5 by Hellige-Truog.

Range in Characteristics

Depth to bedrock: More than 203 centimeters (80 inches)
Rock fragments: 0 to as much as 15 percent rounded or subrounded fragments from 2 millimeters to 10 inches across in individual horizons; 0 to 15 percent coal fragments from 1 millimeter to 3 inches across
Soil reaction: Strongly acid to moderately alkaline

The A horizon has hue of 2.5Y or 10YR, value of 2 to 5, and chroma of 2 to 4. After mixing to a depth of 6 inches, however, it has value and chroma of less than 4 moist. The horizon is silt loam, loam, fine sandy loam, sandy loam, loamy sand, or loamy fine sand and is commonly stratified.

The C horizon has hue of 2.5Y or 10YR, value of 3 to 6, and chroma of 2 to 6. Texture is silt loam, loam, fine sandy loam, sandy loam, loamy fine sand, or loamy sand. The horizon is stratified in some pedons.

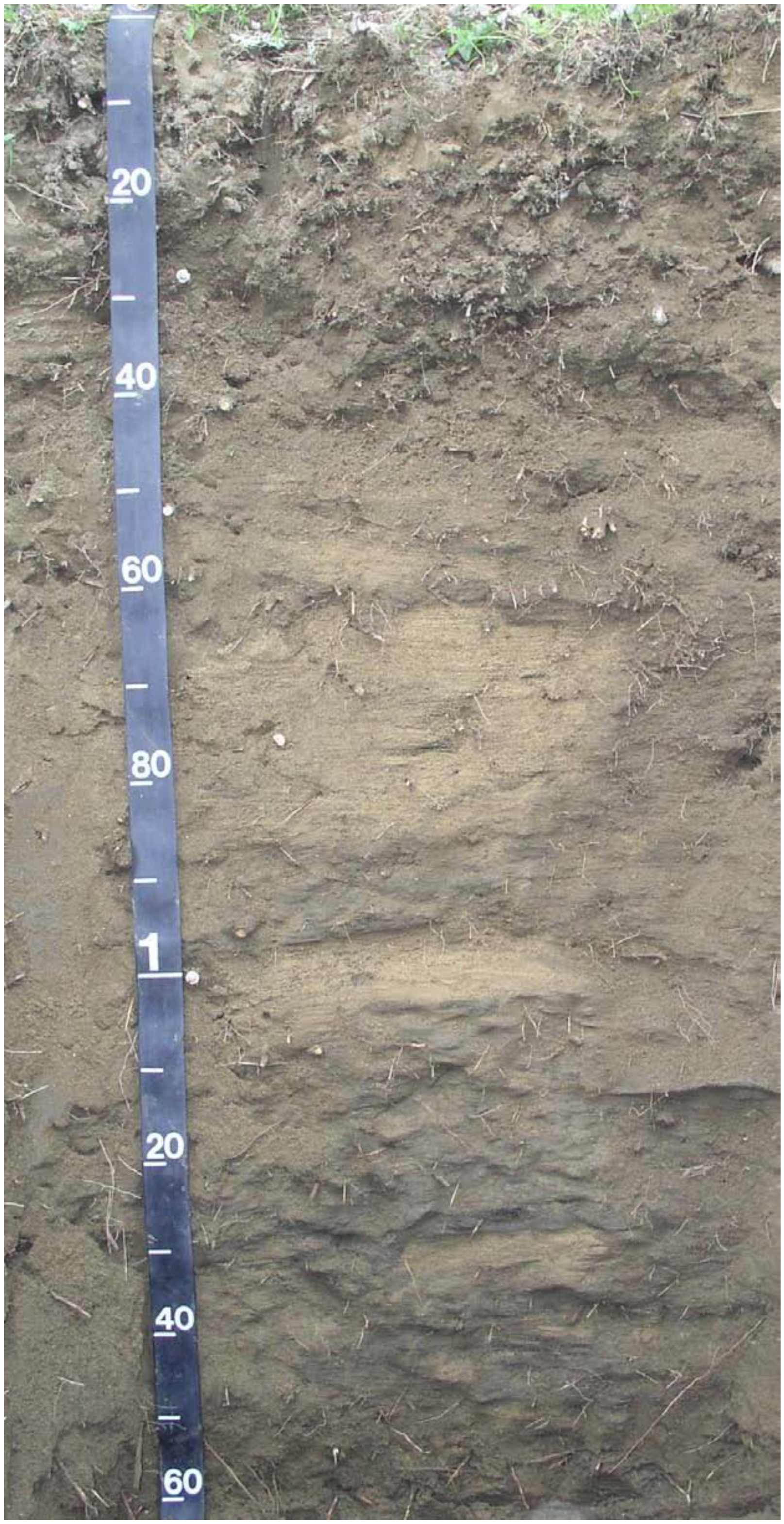


Figure 42.—Profile of Nelse sandy loam. Scale is in centimeters. Nelse soils formed on active flood plains. Variations in horizon colors indicate different depositional events. (Image is from Lincoln County, West Virginia.)

The Nelse soils in New River Gorge National River are considered a taxadjunct to the series because they typically have sandier textures in the particle-size control section than what is allowed by the series. This difference, however, does not significantly affect the use and management of the soils.

Philo Series

The Philo series consists of very deep, moderately well drained soils that formed in recent alluvium derived mainly from Pennsylvanian-age sandstone and shale. Philo soils are on flood plains in mountain valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts

Typical Pedon

Philo loam (fig. 43); Fayette County, West Virginia; on 2 percent slope in a forested area in the Craig Branch area off Gatewood Road; at an elevation of 580 meters (1,902 feet); lat. 38 degrees 02 minutes 25 seconds N. and long. 81 degrees 03 minutes 31 seconds W.; NAD83; Fayetteville, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oe—0 to 4 centimeters (0 to 2 inches); moderately decomposed plant material; abrupt irregular boundary.

A—4 to 10 centimeters (2 to 4 inches); very dark brown (10YR 2/2) (broken face) loam; moderate fine granular structure; very friable; very strongly acid, pH 4.9 by Hellige-Truog; abrupt smooth boundary.

BA—10 to 34 centimeters (4 to 13 inches); dark grayish brown (10YR 4/2) (broken face) sandy loam; weak very fine and fine subangular blocky structure; very friable; very strongly acid, pH 4. by Hellige-Truog; gradual wavy boundary.

Bw1—34 to 45 centimeters (13 to 18 inches); yellowish brown (10YR 5/6) (broken face) sandy loam; weak fine subangular blocky structure; friable; very strongly acid, pH 4.5 by Hellige-Truog; gradual wavy boundary.

Bw2—45 to 64 centimeters (18 to 25 inches); light yellowish brown (10YR 6/4) (broken face) sandy loam; weak fine and medium subangular blocky structure; friable; 2 percent fine and medium distinct light brownish gray (10YR 6/2) iron depletions with clear boundaries in matrix; 2 percent fine and medium distinct strong brown (7.5YR 5/6) and 8 percent medium and coarse distinct strong brown (7.5YR 4/6) masses of oxidized iron with clear boundaries in matrix; very strongly acid, pH 4.6 by Hellige-Truog; gradual wavy boundary.

C1—64 to 78 centimeters (25 to 31 inches); light yellowish brown (2.5Y 6/4) (broken face) loamy sand; single grain; friable; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

C2—78 to 95 centimeters (31 to 37 inches); light yellowish brown (2.5Y 6/4) (broken face) loamy sand; single grain; very friable; very strongly acid, pH 4.8 by Hellige-Truog; gradual wavy boundary.

C3—95 to 165 centimeters (37 to 65 inches); light yellowish brown (10YR 6/4) (broken face) sandy loam; massive; very friable; 1 percent fine distinct strong brown (7.5YR 5/6) masses of oxidized iron in matrix and 2 percent medium distinct light gray (10YR 7/1) iron depletions in matrix; very strongly acid, pH 4.7 by Hellige-Truog.

Range in Characteristics

Solum thickness: 51 to 122 centimeters (20 to 48 inches)

Figure 43.—Profile of Philo loam. Scale is in feet. Philo soils have a seasonal fluctuating water table that rises to within depths of 46 to 91 centimeters (18 to 36 inches).

Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 0 to 20 percent in the A, Bw, and C horizons and 0 to 40 percent in the 2C horizon; some pedons have 0 to 40 percent rock fragments in the C horizon and 0 to 75 percent fragments in 2C horizons below a depth of 40 inches
Reaction: Very strongly acid to moderately acid in unlimed areas

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. If moist value is 3, either the dry value is more than 5.5 or the A horizon is less than one-third of the thickness from the soil surface to the base of the cambic horizon. Texture of the fine-earth fraction is silt loam, loam, sandy loam, or fine sandy loam.

Some pedons have a BA horizon. This horizon has hue of 7.5YR, 10YR, or 2.5Y and value and chroma of 3 to 6. Texture of the fine-earth fraction is silt loam, loam, sandy loam, or fine sandy loam.

The Bw horizon has hue of 7.5YR, 10YR, or 2.5Y and value and chroma of 3 to 6. Low-chroma redoximorphic features range from dark grayish brown (10YR 4/2) to light gray (10YR 6/1). High-chroma redoximorphic features range from dark brown (7.5YR 4/4) to strong brown (7.5YR 5/8). Texture of the fine-earth fraction is silt loam, loam, fine sandy loam, or sandy loam. In some pedons, thin occur horizons where the fine-earth fraction is very fine sandy loam.

Some pedons have a BC horizon. This horizon has colors and textures similar to those of the Bw horizon.

The C horizon is neutral in hue or has hue of 7.5YR, 10YR, 2.5Y, or 5Y, has value of 4 to 6, and has chroma of 0 to 6. It has redoximorphic features that are strong brown (7.5YR 5/6 or 5/8), yellowish red (5YR 4/6), or redder. If matrix chroma is more than 2, redoximorphic features have chroma of 2 or less. Texture of the fine-earth fraction in the C horizon is silt loam, loam, fine sandy loam, or sandy loam. Texture of the fine-earth fraction in the 2C horizon ranges from sand to silt loam.

Pipestem Series

The Pipestem series consists of very deep, well drained soils that formed in colluvium derived from Mississippian-age shale and siltstone interbedded with fine grained sandstone and thin beds of limestone. The surface of Pipestem soils is commonly covered with stones and boulders from the Pennsylvanian-age Pottsville Group. These soils are on mountain slopes and footslopes (fig. 44). Slopes range from 3 to 80 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Fine, mixed, active, mesic Dystric Eutrudepts

Typical Pedon

Pipestem channery silty clay loam (fig. 45); Raleigh County, West Virginia; in a forested area on a 60 percent mountain slope above the National Park Service river access road near Prince, about 5.44 kilometers (3.4 miles) on Glade Creek Road, east-southeast of the junction of Glade Creek Road and West Virginia Route 41; at an elevation of 415 meters (1,361 feet); lat. 37 degrees 49 minutes 54 seconds N. and long. 81 degrees 02 minutes 60 seconds W.; NAD83; Prince, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A—0 to 11 centimeters (0 to 4 inches); brown (7.5YR 5/3) (crushed and dry) channery silty clay loam, dark brown (7.5YR 3/3) (crushed and moist); moderate medium granular structure; very friable; common very fine to very coarse roots throughout; 5 percent sandstone flagstones and 10 percent flat siltstone channers; strongly acid, pH 5.5 by pH meter 1:1 water; clear wavy boundary.

BA—11 to 30 centimeters (4 to 12 inches); 20 percent dark brown (7.5YR 3/3) and 80 percent reddish brown (5YR 4/3) (broken face) stony silty clay loam; moderate medium subangular blocky structure; very friable; common very fine to very coarse roots throughout; 5 percent sandstone stones, 5 percent sandstone flagstones, and 10 percent siltstone channers; strongly acid, pH 5.6 by pH meter 1:1 water; clear wavy boundary.

Bw1—30 to 61 centimeters (12 to 24 inches); reddish brown (5YR 4/3) (broken face) stony silty clay loam; moderate medium subangular blocky structure; friable; common very fine to very coarse roots throughout; 40 percent continuous distinct reddish brown (5YR 4/3) clay films on vertical faces of peds; 5 percent sandstone stones, 5 percent sandstone flagstones, and 10 percent siltstone channers; strongly acid, pH 5.6 by pH meter 1:1 water; gradual wavy boundary.

Figure 44.—Pipestem soils are prone to landslides due to a high clay content and low soil strength. (Image is from Webster County, West Virginia.)

Bw2—61 to 98 centimeters (24 to 39 inches); 50 percent reddish brown (5YR 4/3) and 50 percent dark reddish brown (2.5YR 3/3) (broken face) flaggy silty clay loam; moderate medium subangular blocky structure; friable; common fine to medium roots throughout; 40 percent continuous distinct reddish brown (5YR 4/3) clay films on vertical faces of peds; 5 percent sandstone stones, 10 percent siltstone channers, and 10 percent sandstone flagstones; strongly acid, pH 5.3 by pH meter 1:1 water; gradual wavy boundary.

Bw3—98 to 137 centimeters (39 to 54 inches); dark reddish brown (2.5YR 3/3) (broken face) flaggy silty clay loam; weak medium subangular blocky structure; friable; common fine to medium roots throughout; 40 percent continuous distinct reddish brown (5YR 4/3) clay films on vertical faces of peds; 5 percent sandstone stones, 10 percent siltstone channers, and 10 percent sandstone flagstones; very strongly acid, pH 5.1 by pH meter 1:1 water; gradual wavy boundary.

Figure 45.—Profile of Pipestem channery silty clay loam. Disoriented rock fragments indicate that this soil formed in colluvium. Scale is in centimeters.

BC—137 to 160 centimeters (54 to 63 inches); dark reddish brown (2.5YR 3/3) (broken face) very stony silty clay loam; weak medium columnar structure; friable; common fine roots throughout; 10 percent sandstone stones, 10 percent sandstone flagstones, and 15 percent flat siltstone channers; very strongly acid, pH 5.1 by pH meter 1:1 water.

Range in Characteristics

Solum thickness: 83 to 200 centimeters (33 to 79 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 5 to 35 percent, by volume, in the A horizon, 5 to 60 percent in subhorizons of the B horizon, and 15 to 75 percent in the C horizon (if it occurs); a

mixture of channers, gravel, flagstones, and stones of siltstone, shale, fine-grained sandstone, and, in some areas, limestone; the volume and size of the fragments generally increases as depth increases

Soil reaction: Strongly acid to neutral

The A horizon has hue of 7.5YR to 2.5YR, value of 2.5 to 4, and chroma of 2 to 4. Texture is silt loam or silty clay loam.

The BA horizon (if it occurs) has hue of 7.5YR to 2.5YR and value and chroma of 3 or 4. Texture is silt loam or silty clay loam.

The Bw horizon has hue of 7.5YR to 2.5YR and value and chroma of 3 or 4. Texture is silt loam, silty clay loam, or silty clay. The clay content ranges from 25 to 45 percent, and the weighted average in the control section is more than 35 percent.

The BC and C horizons (if they occur) have colors and textures similar to those of the B horizon.

Pope Series

The Pope series consists of very deep, well drained soils that formed in acid alluvium from Pennsylvanian-age sandstone, siltstone, and shale. Pope soils are on flood plains in mountain valleys. Slopes range from 0 to 3 percent. The mean annual precipitation is about 1,172 millimeters (46.15 inches), and the mean annual temperature is about 10.9 degrees C (51.6 degrees F).

Taxonomic Classification

Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts

Typical Pedon

Pope sandy loam (fig. 46); Nicholas County, West Virginia; on a 3 percent slope in a forested area approximately 198 meters (650 feet) west of the boat launch at the Masons Branch river take out on the Upper Gauley River; at an elevation of 317 meters (1,040 feet); lat. 38 degrees 13 minutes 23 seconds N. and long. 80 degrees 59 minutes 32 seconds W.; NAD83; Summersville Dam, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 5 centimeters (0 to 2 inches); slightly decomposed plant material; abrupt broken boundary.

Oe—5 to 8 centimeters (2 to 3 inches); moderately decomposed plant material; abrupt broken boundary.

A—8 to 18 centimeters (3 to 7 inches); dark brown (10YR 3/3) (broken face) sandy loam; weak medium granular structure; 5 percent sandstone gravel; very strongly acid, pH 4.6 by Hellige-Truog; abrupt wavy boundary.

Bw1—18 to 56 centimeters (7 to 22 inches); yellowish brown (10YR 5/6) (broken face) sandy loam; weak medium subangular blocky structure; 1 percent very weakly cemented charcoal fragments, 2 percent sandstone cobbles, and 8 percent sandstone gravel; very strongly acid, pH 4.6 by Hellige-Truog; clear wavy boundary.

Bw2—56 to 81 centimeters (22 to 32 inches); strong brown (7.5YR 5/6) (broken face) gravelly sandy loam; weak coarse subangular blocky structure; 5 percent sandstone cobbles and 10 percent sandstone gravel; very strongly acid, pH 4.5 by Hellige-Truog; gradual wavy boundary.

C—81 to 200 centimeters (32 to 79 inches); yellowish brown (10YR 5/6) (broken face) extremely cobbly loamy sand; single grain; 10 percent sandstone stones, 25 percent sandstone cobbles, and 30 percent sandstone gravel; very strongly acid, pH 4.5 by Hellige-Truog.

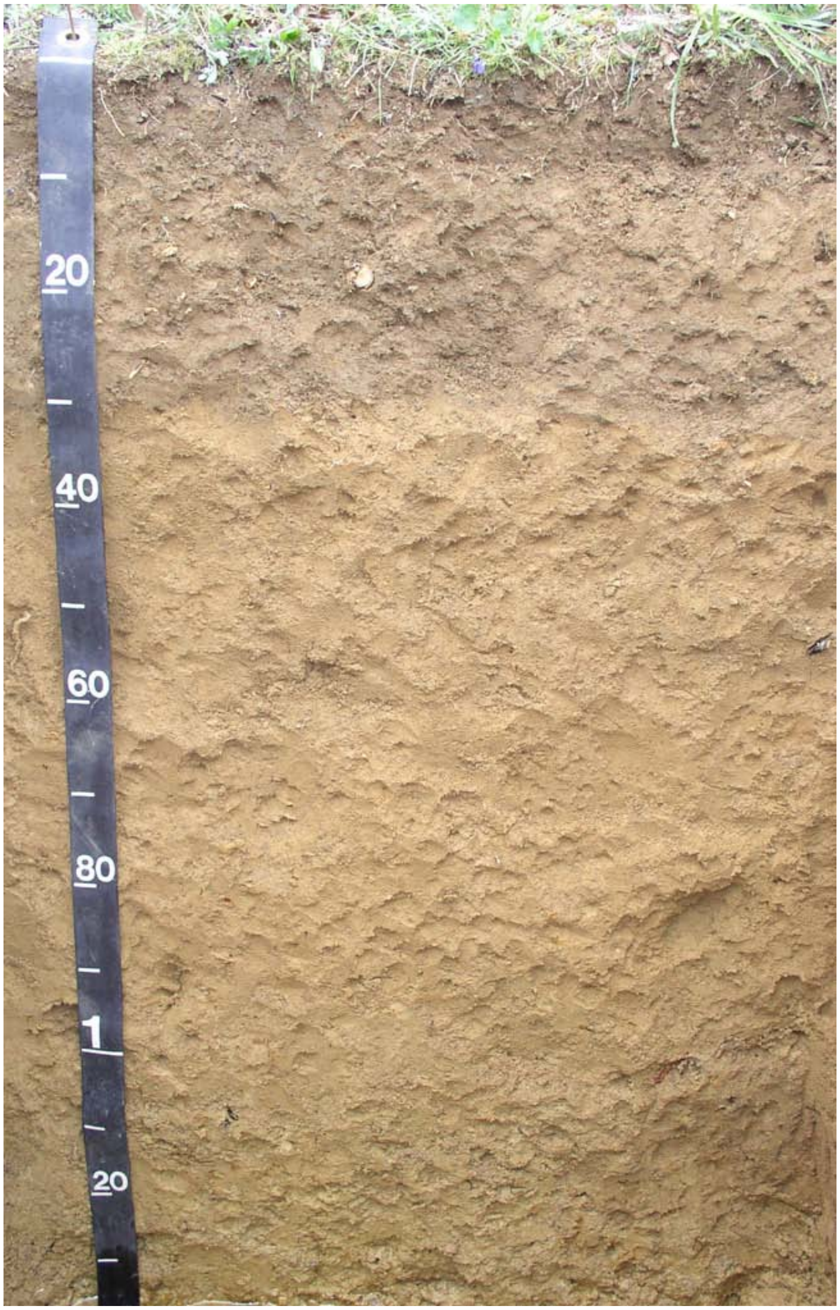


Figure 46.—Profile of Pope sandy loam. Scale is in centimeters. The bright yellowish brown colors in the subsoil indicate a well drained soil. (Image is from Lincoln County, West Virginia.)

Range in Characteristics

Solum thickness: 72 to 200 centimeters (30 to 60 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 0 to 30 percent, by volume, in the solum and 0 to 75 percent in the substratum; gravel, channers, and cobbles
Soil reaction: Very strongly acid or extremely acid

The Ap or A horizon has hue of 10YR and value and chroma of 3 to 6. If value is 3, dry color is 6 or more. Texture of the fine-earth fraction is fine sandy loam, sandy loam, loam, or silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons, it has iron depletions with chroma of 2 or less below a depth of 40 inches. Texture of the fine-earth fraction is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam.

The C or 2C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons it has iron depletions with chroma of 2 or less. The texture of the fine-earth fraction is loamy sand, loamy fine sand, fine sandy loam, sandy loam, loam, or sandy clay loam, or the horizon has stratified layers of these textures. Some pedons have stratified sand layers below a depth of 40 inches.

Potomac Series

The Potomac series consists of very deep, somewhat excessively drained soils that formed in coarse textured alluvial material of primarily Mississippian-age sandstone, siltstone, shale, and some limestone. Potomac soils are on high-energy flood plains in river valleys. Slopes range from 0 to 5 percent. The mean annual precipitation is about 959 millimeters (37.77 inches), and the mean annual temperature is about 11.7 degrees C (53.1 degrees F).

Taxonomic Classification

Sandy-skeletal, mixed, mesic Typic Udifluvents

Typical Pedon

Potomac gravelly sandy loam (fig. 47); Fayette County, West Virginia; on a 2 percent slope on a forested flood plain of the New River, approximately 4 kilometers (2.5 miles) west of Prince and 482 meters (1,584 feet) south of Terry, near the Army Camp Campground; at an elevation of 346 meters (1,135 feet); lat. 37 degrees 51 minutes 26 seconds N. and long. 81 degrees 05 minutes 59 seconds W.; NAD83; Prince, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

Oi—0 to 2 centimeters (0 to 1 inch); slightly decomposed plant material; very abrupt broken boundary.

Ap—2 to 20 centimeters (1 to 8 inches); dark brown (7.5YR 3/3) (broken face) gravelly sandy loam; weak fine granular structure; 15 percent sandstone gravel; slightly alkaline, pH 7.5 by Hellige-Truog; abrupt smooth boundary.

C1—20 to 46 centimeters (8 to 18 inches); dark brown (7.5YR 3/4) (broken face) gravelly loamy sand; single grain; 25 percent sandstone gravel; neutral, pH 7.0 by Hellige-Truog; clear wavy boundary.

C2—46 to 200 centimeters (18 to 79 inches); brown (7.5YR 4/4) (broken face) stratified very gravelly sand to very gravelly loamy sand; single grain; 15 percent sandstone cobbles and 25 percent sandstone gravel; neutral, pH 7.0 by Hellige-Truog.

Range in Characteristics

Solum (A horizon) thickness: 0 to 20 centimeters (8 inches)
Depth to bedrock: More than 152 centimeters (60 inches)
Rock fragments: 0 to 50 percent in the A horizon; the weighted average, by volume, in the C horizon is dominantly more than 50 percent but ranges from 35 to 70

Figure 47.—Profile of Potomac gravelly sandy loam. Scale is in feet. Potomac soils formed in recent alluvium deposited by high-energy streams. The water moved large volumes of gravel, cobbles, and stones.

percent; in some pedons subhorizons of the C horizon are nearly free of rock fragments and in other pedons they can have up to 80 percent fragments; dominantly sandstone gravel and cobblestones

Soil reaction: Mildly alkaline to very strongly acid

The A horizon has hue of 10YR or 7.5YR, value of 2 to 4 (6 or more dry), and chroma of 2 to 4. Texture of the fine-earth fraction is fine sandy loam, sandy loam, loam, loamy sand, or loamy fine sand. The lower part of the horizon shows evidence of stratification in some pedons.

The C horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. Texture of the fine-earth fraction is loamy sand or sand. The horizon has subhorizons of sandy loam or gravelly or cobbly sandy loam in some pedons.

Udorthents

Udorthents generally consist of well drained, deep or very deep soils. These soils formed in areas that have been disturbed by excavation, grading, filling, or a combination of these activities. The parent material is highly variable but generally consists of a mixture of native soils and excavated bedrock from local sources. Slopes range from 0 to 70 percent. The mean annual precipitation is about 1,004 millimeters (37.8 inches), and the mean annual temperature is about 10.2 degrees C (50.4 degrees F).

Taxonomic Classification

Mesic Udorthents

Typical Pedon

Udorthents in an area of Udorthents-Urban land complex, highways; Summers County, West Virginia; on a 53 percent slope above Route 20 adjacent to the I-64 overpass, approximately 229 meters (750 feet) southeast of Sandstone High School; from aerial photography, site is located within the lower cloverleaf formed by the highway off ramp; at an elevation of 410 meters (1,345 feet); lat. 37 degrees 46 minutes 50 seconds N. and long. 80 degrees 53 minutes 39 seconds W.; NAD83; Meadow Creek, West Virginia USGS topographic quadrangle. (When described, the soil was moist throughout.)

A—0 to 4 centimeters (0 to 2 inches); brown (7.5YR 4/3) (broken face) very channery silt loam; weak very coarse subangular blocky structure parting to moderate fine subangular blocky; friable; common fine and medium and many very fine roots throughout; common fine tubular pores; 1 percent sandstone stones, 5 percent sandstone channers, and 40 percent very weakly cemented siltstone gravel; strongly acid, pH 5.5 by Hellige-Truog; clear wavy boundary.

AC—4 to 27 centimeters (2 to 11 inches); brown (7.5YR 4/4) (broken face) very channery silt loam; weak coarse subangular blocky structure parting to weak fine subangular blocky; friable; common very fine and fine roots throughout and common medium roots around rock fragments; common fine tubular and common medium irregular pores; 5 percent very weakly cemented siltstone gravel, 15 percent weakly cemented sandstone gravel, and 20 percent weakly cemented siltstone channers; very strongly acid, pH 5.0 by Hellige-Truog; gradual wavy boundary.

C—27 to 165 centimeters (11 to 65 inches); reddish brown (5YR 4/4) (broken face) extremely gravelly silt loam; massive; friable; common very fine and fine roots throughout and common medium and coarse roots around rock fragments; common fine tubular and many very coarse irregular pores; 10 percent weakly cemented siltstone stones, 10 percent very weakly cemented siltstone gravel, 20 percent weakly cemented siltstone channers, and 40 percent weakly cemented sandstone gravel; very strongly acid, pH 5.0 by Hellige-Truog.

Range in Characteristics

Solum (A and AC horizons) thickness: Variable; typically less than 38 centimeters (15 inches)
Depth to bedrock: Variable; typically more than 150 centimeters (60 inches)
Rock fragment content: Variable; typically more than 35 percent throughout the profile
Soil reaction: Variable, depending on the nature of the geologic parent material

Formation of the Soils

This section discusses the factors of soil formation and relates them to the soils in New River Gorge National River.

Factors of Soil Formation

Soil covers the surface of the earth as a three-dimensional body with varying depths and is made up of different proportions of organic and mineral material, pore space with gases, and water. Soils differ in their appearance, productivity, and management requirements due to their chemical and physical properties. The characteristics and properties of soils are determined by physical and chemical processes that result from the interaction of soil-forming factors. These factors of soil formation are interdependent, and few generalizations can be made regarding any one factor unless the effects of the other factors are known. The term “pedogenesis” is often used to connote the process of soil formation.

The study of soil science, known as pedology, began in the 19th century as scientists began to consider soils as natural bodies, independent of their underlying geology. This concept developed into a more quantitative principle in which the formation of soil and its properties are the result of interrelated factors. The soil-forming factors are parent material, climate, plant and animal organisms, topography, and time (Jenny, 1941). Parent material is the source material in which soils formed. Soils are influenced by the texture and structure of the parent material and its mineralogical and chemical composition. Climate is predominantly the temperature and kind and amount of precipitation. Organisms are the plants and other organisms living in and on the soil, including humans. Time refers to how long the soil-forming factors have been operating. Relief or topography is the shape and elevation of the landscape. It affects internal and external soil properties, such as soil drainage, aeration, susceptibility to erosion, and the soil’s exposure to the sun and wind. The examination of the relationships and influences of each of these factors within a survey area can help us to better understand the physical and chemical characteristics of soils.

The influence of any one of the soil-forming factors varies among all parks and within localities of a particular park. Soils may differ significantly from place to place in a park and within very short distances. In some cases, parks may have vast stretches of the same type of soil because of uniform soil-forming factors.

Parent Material and Time

Soils are described as having formed in various types of parent material. The properties of the parent material strongly influence the time required for soil formation and the nature of the soils produced. There are four general types of parent material in New River Gorge National River: alluvium, colluvium, residuum, and human-transported material (HTM). Alluvium consists of the detrital materials deposited by streams and includes various combinations of sand, silt, clay, and rock fragments. Colluvium consists of soil materials and rock fragments that accumulate at the base

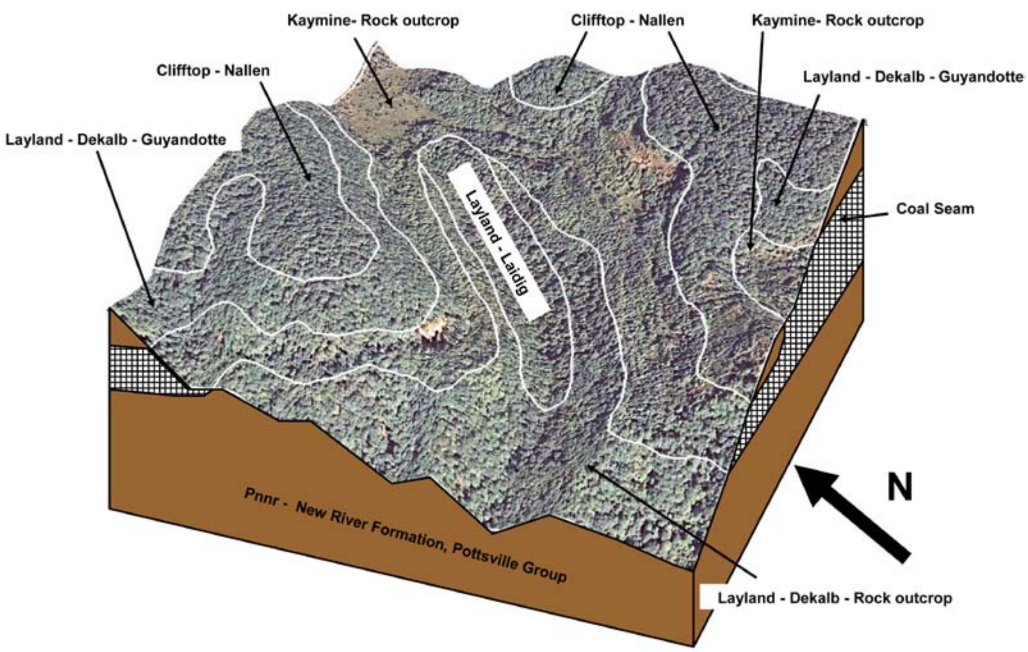


Figure 48.—A representative landscape on the Pottsville Group that illustrates the locations of general soil map units 1 (Clifftop-Nallen-Dekalb), 2 (Layland–Dekalb–Laidig), and 6 (Kaymine–Udorthents–Cedardreek).

of slopes and in concave coves by gravitational action. Residuum consists of soil materials accumulated by the disintegration of consolidated bedrock in place. HTM is unsorted, unconsolidated earthy materials deposited by directed human activity. It includes the regolith generated during the surface mining of coal, waste materials from underground coal mines, and earthy materials used to construct road beds, railroad beds, building sites, etc. These four types of parent material have formed the 30 major soil types which have been correlated and classified within the boundaries of New River Gorge National River. There were 27 soil types correlated and classified to the soil series level and 3 soil types classified at the higher levels of Soil Taxonomy.

The properties of soils are greatly influenced by the properties of their parent bedrocks. Six major geologic formations have weathered to provide the local alluvium, residuum, and colluvium in the park. The New River and Pocahontas Formations of the Pottsville Group (fig. 48) are comprised of Pennsylvanian-age sedimentary bedrock. The New River Formation is dominated by acid sandstone but also contains gray and dark gray siltstone, shale, and coal. The Pocahontas Formation is primarily comprised of acid, brown and gray sandstone with lesser amounts of siltstone, shale, and coal. The Mississippian-age sedimentary materials of the Mauch Chunk Group are represented by the Bluestone, Princeton, Hinton, and Bluefield Formations (fig. 49). The Bluestone Formation consists of shale and siltstone with lesser amounts of sandstone and limestone. The Princeton Formation is a thin layer of sandstone primarily exposed in the area shown on the Meadow Creek topographic quad. The Hinton Formation (fig. 50) and the Bluefield Formation consist of calcareous red, green, and medium gray shale and sandstone with a few thin limestone beds (WVGES, 1919).

Sampling and analysis of the soils on these geologic formations has determined that there are differences in soil chemistry and clay mineralogy which affect soil fertility. Soils that formed in materials weathered from the New River and Pocahontas Formations are very acidic and generally less fertile than other soils in the park.

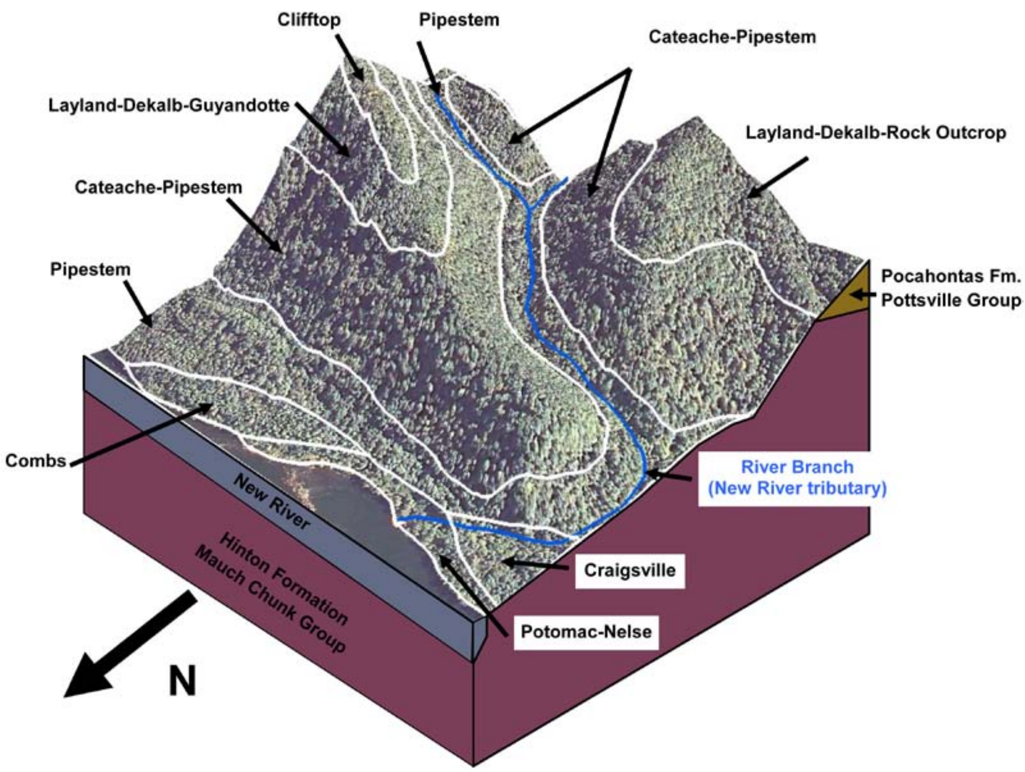


Figure 49.—The landscape at the break between the Pottsville and Mauch Chunk Groups that illustrates the locations of general soil map units 3 (Gilpin–Berks–Highsplint), 4 (Pipestem–Cateache), and 5 (Potomac-Craigsville–Combs).

Figure 50.—The reddish brown shales of the Hinton Formation exposed in a road cut near the mouth of Glade Creek. Cateache and Pipestem soils formed in materials weathered from these rocks.

Because the clay minerals in these soils have been intensely weathered, the soil's ability to retain plant nutrients is hindered. In addition, the sand and silt fraction of many of these soils is dominantly quartz (siliceous mineralogy), which is highly resistant to weathering, is inert, and adds nothing to the soil's nutrient reserves. In comparison, soils that formed from materials weathered from the Bluestone and Princeton Formations are slightly more fertile. They are slightly less acidic, have an array of clay minerals that can hold on to plant nutrients better, and contain more weatherable minerals in the fine-earth fraction. The calcareous shales and limestones of the Hinton and Bluefield Formations produce the most fertile and productive upland soils in the park.

Time refers to a measured period in which soil-forming processes have been at work. Generally, the longer the processes have been at work, the older the soil and the more well developed the soil profile. A well developed soil profile commonly reflects an old and stable landscape. Mature soils exhibit well developed structure, strong colors, and distinct genetic horizons in their profile (fig. 51). In New River Gorge National River, these soil profile features are mainly the result of the addition of silicate clay minerals and oxides of iron and aluminum to the subsoil by translocation, mainly downward, through the soil profile. Young soils lack distinct genetic horizons, strong color, and/or structure in the soil profile because these features have not had time to develop (fig. 52). They commonly reflect a dynamic landscape.

Soils That Formed in Alluvium

Because the New River and its tributary streams are swift and drop in elevation so rapidly, their floodwaters have not deposited great amounts of alluvium in the park (fig. 53). Much of the sediment load in the New River is carried downstream, out of the park. Alluvial soils occur on only 3 percent of the land area in the park. The greatest concentration of alluvium is in the southern region of the park where the gradient of the New River is lowest.

Alluvial soils on active flood plains are generally considered young soils. Because of the dynamic nature of the flood plain, the soils have not been stable long enough for distinct genetic horizons to form. These soils commonly do not exhibit any distinct changes in color or structure development below the soil surface. Sometimes, however, there are abrupt changes in texture or stratification, a result of different depositional events. Alluvial soils may also exhibit dark horizons in the subsoil where old surface horizons, which have been darkened by organic matter, are buried by younger alluvial deposits (fig. 54).

The alluvium on the flood plain of the New River is mainly of remote origin. It has been carried into the park by the floodwaters of the New River from distant areas of the watershed and has been washed from upland soils which formed from a variety of geologic parent materials (including sandstone, shale, siltstone, and limestone). The soils that formed in this alluvium are nonacid in reaction and have high natural fertility. Examples are Chavies, Combs, Nelse, and Potomac soils. Potomac and Nelse soils, which have a high content of coarse sand and rock fragments, generally occur in high-energy environments along the river, near rapids and shoals. Chavies and Combs soils contain less coarse sand and rock fragments and more fine sand and silt than Potomac and Nelse soils. They generally occur along the quieter pools in the river where the lower energy level of the river allows the finer sand and silt particles to settle out of the floodwaters.

The alluvial soils in the Appalachian Riverside Flatrock Community near Sandstone Falls do not fit the concept or classification of any established soil series and therefore are named after a higher level of Soil Taxonomy—Lithic Hapludolls. These soils formed in a thin veneer of sandy and gravelly alluvium which has been deposited on the bedrock forming the falls. Due to their coarse textures and shallow depth, they

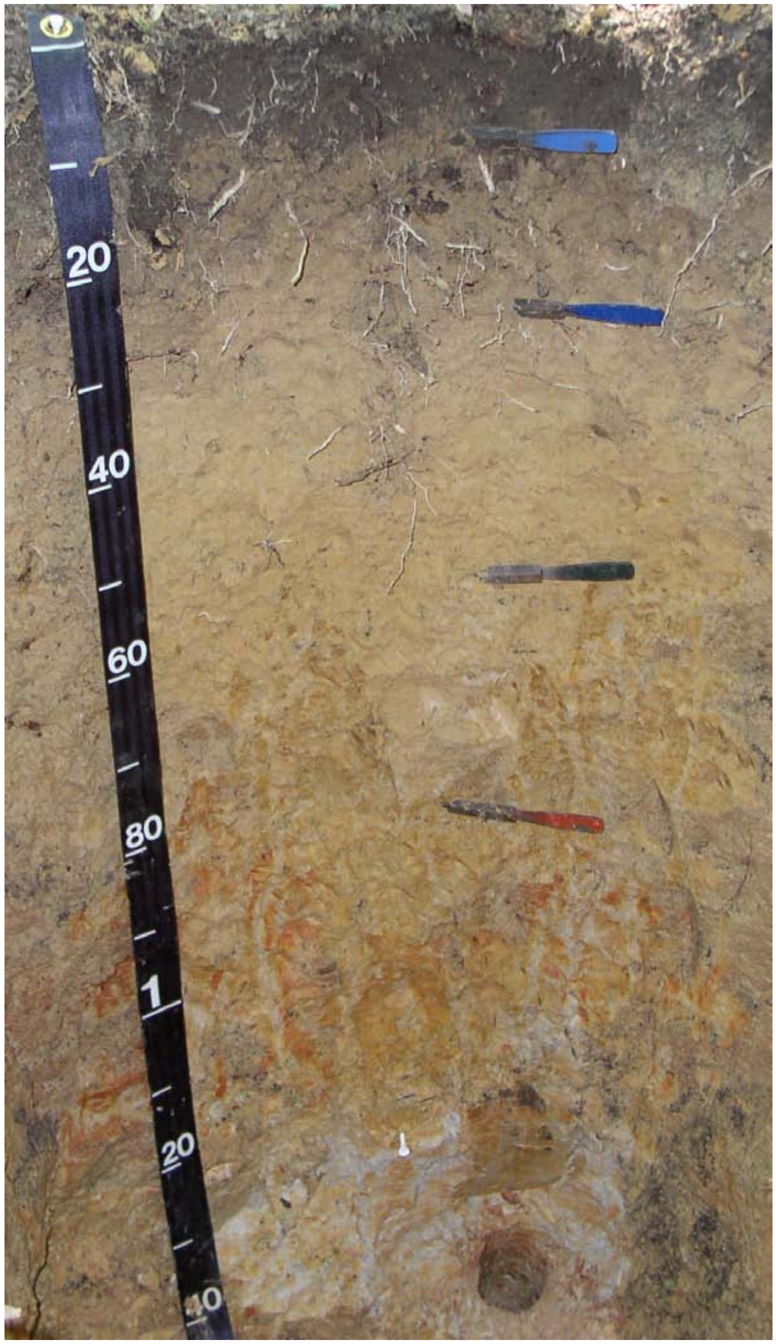


Figure 51.—Profile of a taxadjunct of the Cookport series (fine-loamy, mixed, semiactive, mesic Aquic Fragiudults) showing the strong colors and well developed structure of a mature soil. Scale is in centimeters.

have a very low water-holding capacity, which creates conditions favorable to a unique array of plant life.

Some of the alluvium along the New River is strictly of local origin. An example is the alluvium that has accumulated to form alluvial fans at the mouths of some of the tributaries of the New River, such as Glade Creek and Mill Creek. This alluvium mainly originates from the acid bedrocks of the Pennsylvanian-age Pottsville Group.

Figure 52.—Profile of a Layland soil (loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts), a young soil, showing a lack of strong and well developed structure in the subsoil. Scale is in inches.

Craigsville soils formed in this alluvium, which is acid in reaction and contains high amounts of sand and rock fragments, reflecting the high-energy depositional environment in which the soils occur.

Alluvium that has been deposited on the flood plains of the New River's tributaries on the plateau is also of local origin. Atkins, Philo, and Pope soils all formed in local alluvium which has washed from acid upland soils. These soils occur along the flood plains of Fern Creek, Craig Branch, Kates Branch, and Sewell Branch. They are acid in reaction, reflecting the acid upland soils which are the source of their parent material. Atkins and Philo soils are subject to periodic saturation, which induces anaerobic conditions within the soil profile. Under these conditions, iron in the soil becomes soluble and migrates within the soil matrix, precipitating out of solution along structural faces and pores where air has been trapped or has infiltrated the system. This process creates the mottled appearance (redoximorphic features) typical of saturated soils. The depth to mottling is an indicator of the depth to seasonal saturation within the soil.

Some alluvial soils occur on stream terraces that are no longer on the active flood plain. These terraces were formed by the down-cutting action of the streams through the accumulated alluvium and are stable landforms. The soils that formed on these terraces show evidence of this stability in the well developed structure and the accumulations of translocated clay minerals in the subsoil (argillic horizon), which form visible "skins" on the faces of structural units, in pores, and on the surfaces of rock fragments. Examples are Cotaco and Knowlton soils (fig. 55). These soils are also subject to periodic saturation. They are of limited extent in the park. Examples can be found along the upper reaches of Craigs Branch, above Kaymoor.

Soils That Formed in Colluvium

The steep slopes of the New River Gorge and its tributaries and the abundant rainfall are two reasons why colluvium is the most extensive parent material in the park. Colluvial soils occur on about 42 percent of the land area in the park.

When colluvium moves downslope quickly, as in a landslide, it tends to accumulate at the base of slopes (footslopes or toeslopes). When it moves slowly, it tends to accumulate higher on the slope, on concave surfaces (coves) by a process commonly

Figure 53.—The steep gradient and swift currents of the New River at Sandstone Falls.

Figure 54.—Profile of a Combs soil (coarse-loamy, mixed, active, mesic Fluventic Hapludolls) in which an old buried surface horizon, darkened by organic matter, can be seen.

called “soil creep” (or solifluction). Both processes are facilitated when soils are saturated with water.

Like alluvium, the accumulation of colluvium is a dynamic process. Therefore, colluvial landforms, and the soils which occupy them, tend to be relatively young. This is especially true of the colluvial soils on the very steep walls (backslopes) of the New River Gorge. The colluvial soils on these slopes have not been stable long enough for the development of strong structure, the accumulation of translocated clay minerals,

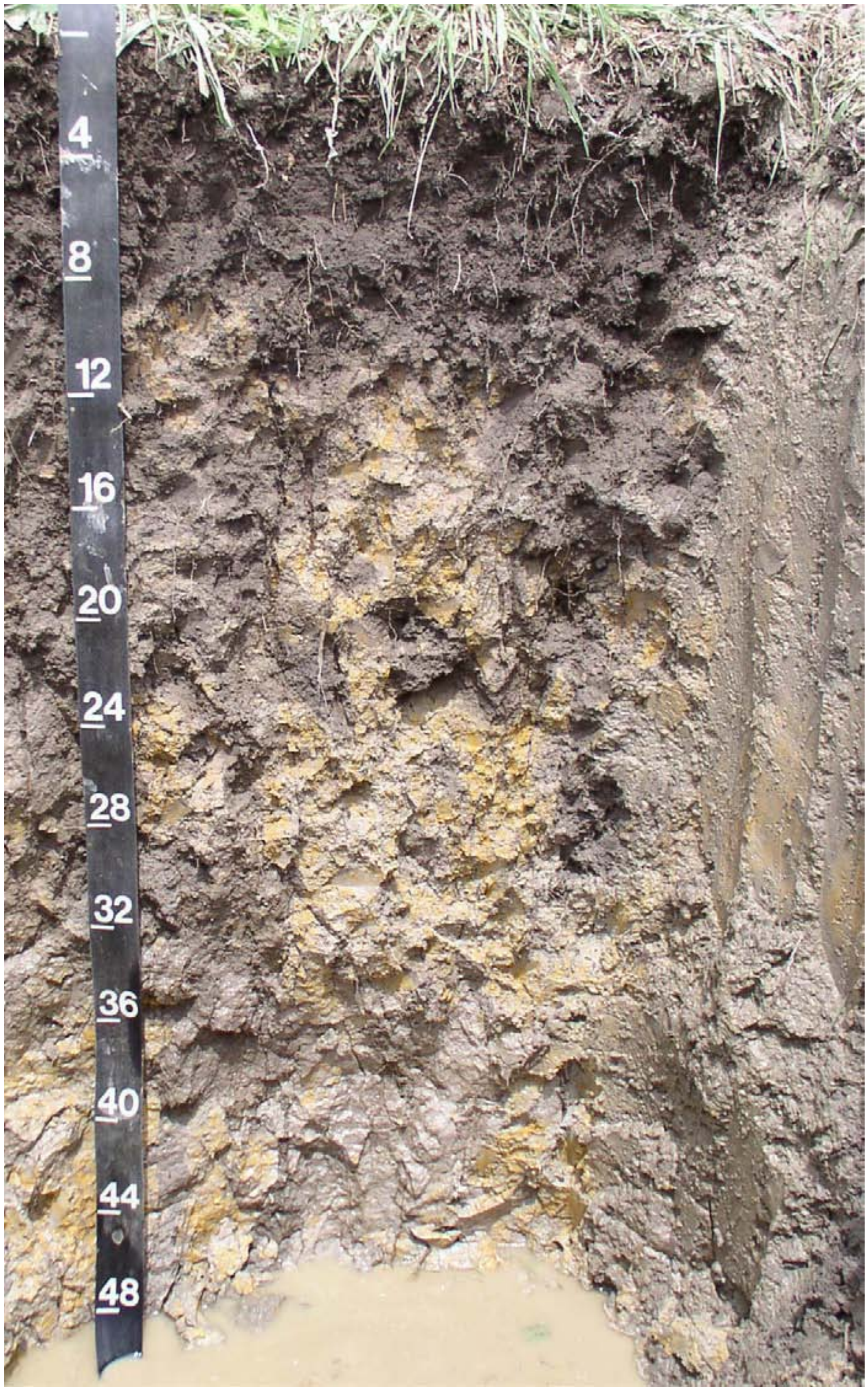


Figure 55.—A profile of a taxadjunct of the Knowlton series (fine-loamy, mixed, active, mesic Typic Endoaquults) showing the mottled color pattern (redoximorphic features) which develop under saturated conditions. Scale is in inches.

or the formation of other distinctive genetic horizons in the subsoil. Examples of young colluvial soils in the park are Guyandotte, Highsplint, Layland, and Pipestem soils.

Guyandotte and Layland soils (fig. 56) are very strongly acid and formed in colluvium derived mainly from the New River and Pocahontas Formations. Highsplint

Figure 56.—Profile of a Layland soil showing disoriented rock fragments in the soil matrix, a result of the movement of the colluvial parent materials downslope. Scale is in centimeters.

soils are strongly acid and formed in colluvium derived mainly from the Princeton and Bluestone Formations. Pipestem soils are moderately acid and formed in colluvium weathered mainly from the Hinton and Bluefield Formations. The Pipestem series is a new soil series; it was first described and classified in New River Gorge National River. The type location for the Pipestem series is on a mountain slope near the mouth of

Glade Creek. Pipestem soils exemplify the dynamic nature of colluvial landforms, as they are very prone to slippage.

Colluvial landforms on gentler slopes on the plateau tend to be older and more stable. The soils that formed on these landforms are mainly Laidig soils. Laidig soils have an argillic horizon. They also contain a genetic horizon deep in the subsoil, called a fragipan. The fragipan is a dense and brittle horizon that impedes the growth of plant roots and the flow of water downward through the soil profile. Like Guyandotte and Layland soils, Laidig soils formed in colluvium derived from the New River Formation and are very strongly acid in reaction.

Soils That Formed in Residuum

Residuum is the second most abundant parent material in the park. Soils that formed in residuum occupy about 41 percent of the land area in the park.

Residual soils mainly occur on old and stable landforms (gently sloping to moderately steep summits and shoulder slopes). Most of these soils are considered to be mature. They are the oldest soils in the park and have undergone pedogenesis long enough to develop structure and strong color. Most of them also have an argillic horizon. Dekalb and Berks soils are exceptions to this rule. These soils occur on steep slopes or formed in materials that are resistant to weathering. These factors combine to slow the pedogenic process and prevent the soils from developing the characteristics of a mature soil.

On the plateau, much of the residuum is derived from the New River Formation. Clifftop, Dekalb (fig. 57), Nallen, Cookport, and Fenwick soils formed in this residuum. These soils are very strongly acid in reaction and have low natural fertility. Good examples of these soils occur on the broad summits above Kaymoor and in Babcock and Grandview Parks.

Berks soils only occur on convex portions of the New River Gorge in the southern part of the park. These soils formed in residuum derived from the bedrocks of the Bluestone Formation and are strongly acid in reaction. They occur on the upper slopes of the gorge near the community of Meadow Creek.

Gilpin and Lily soils occur mainly on summits and shoulder slopes in the southern part of survey area. These soils formed in residuum weathered mainly from different bedrock members of the Bluestone and Princeton Formations. They are very strongly acid in reaction. Gilpin soils have medium fertility; Lily soils have low fertility due to the siliceous nature of the sandstone from which it formed. Good examples of these soils occur on Irish Mountain near Sullivan Knob.

Cateache soils formed in materials weathered from the Hinton and Bluefield Formations. These reddish brown soils occur mainly on convex portions of the New River Gorge. The reaction of these soils ranges from very strongly acid to moderately acid, the pH often increasing as depth increases. Cateache soils have high natural fertility. Good examples of these soils can be seen along Route 20, between the communities of Sandstone and Hinton.

The fine-earth textures of residual soils are mostly inherited from the parent bedrock. For example, Berks, Clifftop, and Gilpin soils formed in residuum derived mainly from shale or siltstone. These bedrocks result in fine-earth textures that are dominated by silt-sized particles with a moderate amount of clay and very little sand. In contrast, Dekalb, Lily, and Nallen soils formed in residuum derived mainly from sandstone. These soils inherited the fine-earth textures that are dominated by sand-sized particles with lesser amounts of silt and very little clay.

Anthropogenic Soils That Formed in Human-Transported Materials (HTM)

Anthropogenic soils make up about 6 percent of the land area in the park. These soils are on landscapes that have been drastically disturbed by humans with the aid of heavy machinery, including surface mines, road beds, railroad beds, and areas

Figure 57.—Profile of a Dekalb soil (loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts) which formed in residuum derived from sandstone bedrock. The bedrock in this photo begins at a depth of about 70 centimeters. Scale is in centimeters.

that have been graded for development. They are the youngest soils in the park. The parent material of these soils has not been in place long enough for pedogenic processes to form any of the characteristic properties of a mature soil. These soils include Cedarceek, Kaymine, and Itmann soils and Udorthents.

Cedarcreek and Kaymine soils formed in the regolith produced from the surface mining of coal. In the park, these soils are primarily associated with the Sewell, Firecreek, and Pocahontas coal seams. Some of these areas have been reclaimed. Many areas of these soils, however, predate the use of modern reclamation practices and have a highwall (rock outcrop) associated with them. Cedarcreek soils are more acidic than Kaymine soils and have a higher percentage of sandstone fragments throughout their profile.

Itmann soils formed in regolith of waste materials from underground coal mines. These soils contain high amounts of waste coal and carbolithic materials, which make them very dark gray to black (fig. 58). Because of the dark color, they absorb solar energy and become hot, making the establishment of vegetation difficult. These soils are of limited extent in the park. An example of Itmann soils is near the old Kaymoor mines.

Udorthents are soils that formed in HTM. The properties of these soils are so variable that they cannot be classified as a soil series. In layman’s terms, these soils are “cut and fill” materials. In some areas, Udorthents have been graded to meet site needs. They tend to be deep or very deep in areas that have been filled and raised above the original ground level. Lithic Udorthents formed in the substratum of native

Figure 58.—A profile of Itmann soils (loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents) showing the typical dark colors inherited from waste coal and carbolithic materials. Scale is in centimeters.

soils or in weathered bedrock exposed by excavations for road grades. These soils are shallow and droughty. An example of Lithic Udorthents can be seen in the road cuts along Interstate 64, east and west of the bridge over the New River, downstream from Sandstone.

Climate

Temperature and moisture influence soil formation and are the two most commonly measured features of climate. Weathering is most active when soils are moist and warm since these soil conditions are conducive to rapid chemical reactions. Cooler temperatures result in slower chemical reactions. While average temperatures and amounts of precipitation are important, the extremes of weather in any given locale also play a major role in soil formation.

During periods of rainfall or snowmelt, water carrying dissolved or suspended solids moves through the soil in a process called leaching. The leaching process becomes active with the onset of rainfall or snowmelt. Differences in temperature and the amount of moisture cause different patterns of weathering and leaching in the soil. Seasonal and daily changes in temperature affect moisture availability, biological activity, rates of chemical reactions, and kinds of vegetation.

Present-day climate variations are the result of topography and relief. In most areas of the United States, temperature generally decreases as elevation increases and precipitation generally increases as elevation increases. As the amount of precipitation increases, the extent of leaching and the amount of vegetation generally increase to a point where they then decrease because of decreasing temperatures. Colder temperatures result in less leaching because of decreased microbial growth, decreased vegetation, and possibly frozen soil. Fluctuations in temperature and moisture affect the rate of organic matter decomposition and accumulation and the weathering of minerals. For these reasons, the cycling of bases is pronounced in areas that have a warm climate and large amounts of vegetation.

The climate of New River Gorge National River is a humid continental type characterized by marked seasonal temperature changes and relatively uniform precipitation throughout the year (Vanderhorst and others, 2007). There are, however, noticeable differences between the climate on the plateau and the climate in the valley of the New River. On the plateau, climate data recorded at the Beckley VA Hospital, at an elevation of 784 meters (2,504 feet), shows a mean annual air temperature of 10.2 degrees C (50.4 degrees F), a mean annual precipitation of 1,004 millimeters (39.54 inches), and an average of 141 frost-free days per year. In the New River valley, the station at Bluestone Lake, at an elevation 424 meters (1,390 feet), shows a mean annual air temperature of 11.7 degrees C (53.1 degrees F), a mean annual precipitation of 959 millimeters (37.77 inches), and an average of 181 frost-free days per year.

This climate profile is a somewhat intense weathering regime when considering soil formation. The soils in the park are not dry or frozen for long periods, so soil formation processes are active throughout the year. All the soils in the park have a mesic (temperate) soil temperature regime. Most of the park’s soils have a udic (usually moist) soil moisture regime; exceptions are Atkins and Knowlton soils, which are wetland soils and have an aquic (usually wet) soil moisture regime.

Differences in climate can result in differences in soils. This is evidenced by Guyandotte soils (fig. 59), which occur in coves on backslopes with a north aspect. The coves are cooler and more moist than other positions on the landscape. These conditions slow the oxidation of organic matter and allow it to accumulate in the surface layer of the soil. The result is a soil with a thick, dark, highly organic surface horizon (umbric epipedon). This horizon holds nutrients, increases the soil’s array of micro- and macro-fauna, increases the water-holding capacity, and creates an ideal environment for the growth of plants. Guyandotte soils are very productive woodland soils and produce some of the most diverse stands of hardwood trees, wildflowers, and herbs in the park.

Plant and Animal Organisms

Plants, animals, micro-organisms, and humans affect the formation of soils. Flora, such as fungi and bacteria, help to decompose organic matter and add nutrients to the soil. Animals and micro-organisms mix soils and form burrows and pores. Earthworms are one example of animals that have a major affect in soil formation; a single earthworm can produce almost 10 pounds of castings a year. Plant roots open channels in the soils. Abandoned tunnels commonly are filled with loose material from the overlying horizons and transmit water more readily than the surrounding undisturbed soil material.

Figure 59.—Profile of Guyandotte very gravelly loam. The thick dark surface horizon results from the accumulation or organic matter. Scale is in inches.

Different types of roots have different effects on soils. Grass roots are fibrous near the surface and easily decompose, adding organic matter to the soil. Fine grass roots can extend below the surface for many feet. Plant roots also help to develop soil structure and aggregate stability. Vegetation increases soil stability by protecting the surface against erosion. Taproots are thicker and stronger than most

Figure 60.—A view of the New River Gorge, looking upstream from Stretcher Neck. The moderately deep Dekalb soils occur on the convex portions of the landscape (nose slopes), and the very deep Layland soils occur in the concave positions (coves).

other roots and can open pathways through dense and, in some cases, otherwise impermeable layers. Micro-organisms affect chemical exchanges between roots and soil, such as processing nitrogen into more readily available forms for plant uptake. Humans also can mix the soil extensively, such as with farming, rail line construction, and dam construction. Soil profiles in some of the flatter ridgetop areas of the park show evidence of past farming, a mixing of the top layers resulting from plowing and cultivation. Some of these areas are now covered in forest but were cleared and farmed as recently as 60 years ago.

Native vegetation depends on climate, topography, and biological factors as well as many soil factors, such as soil density, depth to bedrock, chemistry, temperature, and moisture. Leaves from plants fall to the surface and decompose on the soil. Organisms help to decompose these leaves and mix them with the upper part of the soil, resulting in the cycling of nutrients and energy back to vegetation. Trees and shrubs have large roots that may grow to considerable depths and aid in the fracturing of underlying rocks.

With the exception of the anthropogenic soils, all of the soils in New River Gorge National River formed under mixed mesophytic (hardwood) forest. This forest represents one of the most biologically diverse temperate regions of the world (Loucks and others, 2001). Most of these forest soils are topped by thin, dark organic layers that formed as a result of the breakdown of forest litter, including leaves and woody debris. The recycling effect of the deciduous forest concentrates the base cations (nutrients) in the upper part of the soil profiles (epipedons).

Topography

Topography refers to the shape of the landscape and differences in elevation. The overall landscape in New River Gorge National River is the result of erosional processes. These processes may have occurred in response to changes in climate, fluctuating sea levels, and/or tectonic activities. Cyclic periods of landscape stability and instability influence the types of soils that form on a landscape.

The slope and aspect of the overall landscape can affect the moisture and temperature of the soil. For example, steep slopes facing the sun are warmer. The effects of aspect on soils in this park were not large enough to delineate at the scale of mapping.

On most landscapes, landforms that shed water the fastest tend to have the shallowest soils because they erode and lose their topsoil as they form. Thus, soils on the convex portions (nose slopes) of steep backslopes are thinner than soils on less sloping concave surfaces (coves) that concentrate water and receive soil materials from areas upslope. Examples of soils on steep convex slopes are Berks and Dekalb soils (fig. 60). Both of these soils are less than 1 meter deep to bedrock. In contrast, soils on concave surfaces below these soils, such as Highsplint and Layland soils, are more than 2 meters deep (and commonly much deeper). Soils on steep slopes also show less development than soils on gentle slopes since they shed water faster and less water moves through the soil profile to facilitate pedogenesis. Soil-forming factors continue to affect soils even on more stable landforms. Materials are deposited on the surface, and materials are blown or washed away from the surface. Additions, removals, and alterations are slow or rapid, depending on climate, landscape position, and biological activity.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487–00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. 2002. Field indicators of hydric soils in the United States. Version 5.0.

Jenny, Hans. 1941. Factors of soil formation.

Loucks, C., and others. 2001. Terrestrial ecoregions of North America: A conservation assessment.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/technical/nfmanual/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/technical/

United States Department of Agriculture, Natural Resources Conservation Service. PLANTS database. National Plant Data Center. http://plants.usda.gov

United States Department of Agriculture, Natural Resources Conservation Service. 2007. Soil survey of Mercer and Summers Counties, West Virginia.

United States Department of Agriculture, Natural Resources Conservation Service. 2010a. Field indicators of hydric soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble, editors. USDA-NRCS in cooperation with the National Technical Committee for Hydric Soils.

United States Department of Agriculture, Natural Resources Conservation Service. 2010b. Soil survey of Fayette and Raleigh Counties, West Virginia.

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

United States Department of the Interior, National Park Service. Kaymoor. New River Gorge National River website. Accessed 2011a. http://www.nps.gov/neri/historyculture/kaymoor.htm

United States Department of the Interior, National Park Service. Mary Draper Ingles. New River Gorge National River website. Accessed 2011b. http://www.nps.gov/neri/historyculture/mary-draper-ingles.htm

United States Department of the Interior, National Park Service. Natural features and ecosystems. New River Gorge National River website. Accessed 2011c. http://www.nps.gov/neri/naturescience/naturalfeaturesandecosystems.htm

United States Department of the Interior, National Park Service. Nuttallburg. New River Gorge National River website. Accessed 2011d. http://www.nps.gov/neri/historyculture/nuttallburg.htm

Vanderhorst, James P., James Jeuck, and Susan C. Gawler. 2007. Vegetation classification and mapping of New River Gorge National River, West Virginia. Technical Report NPS/NER/NRTR-2007/092.

West Virginia Geological Survey (WVGES). 1919. Fayette County report. Ray V. Hennen, D.D. Teets, R.C. Tucker, and A.M. Hagan, editors.

Glossary

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.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

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

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

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.

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.

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.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil 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.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

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.

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.

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.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

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.

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.

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.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

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.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Leaching. The removal of soluble material from soil or other material by percolating water.

LEP. See Linear extensibility percent.

Linear extensibility (LE). Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Linear extensibility percent. Refers to the percent change in linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.
Low strength. The soil is not strong enough to support loads.
Major land resource area (MLRA). A geographic area that generally has similar soils, vegetation, water, climate, elevation, relief, and land use characteristics.
Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.
Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.
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.
Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)
Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.
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.
Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.
Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.
Percolation. The movement of water through the soil.
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.)

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

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.

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.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

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.

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.

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.

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.

Series, soil. A group of soils that have profiles that are almost alike. 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.

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.

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.

Sodic (alkali) 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.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum 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.

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.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). 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.”

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

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.

Tables

Table 1A.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Oak Hill, West Virginia)

Month	Temperature (degrees F)						Precipitation (inches)				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snow-fall
January--	39.6	20.9	30.2	66	-9	34	3.57	2.11	4.90	9	15.7
February-	43.9	23.4	33.6	71	-2	61	3.20	2.15	4.19	8	10.5
March----	53.0	30.8	41.9	79	8	168	3.99	2.47	5.16	9	6.3
April----	63.3	39.3	51.3	85	19	360	3.94	2.28	5.57	9	1.5
May------	71.5	47.6	59.5	86	30	605	4.51	2.95	6.03	9	0.0
June-----	78.5	55.7	67.1	90	39	810	4.30	2.53	6.00	9	0.0
July-----	82.1	59.9	71.0	91	46	962	5.29	3.76	6.84	9	0.0
August---	80.9	58.8	69.9	91	46	926	4.05	2.72	5.41	7	0.0
September	74.8	52.6	63.7	89	35	711	3.52	1.91	4.97	7	0.0
October--	64.6	41.0	52.8	81	24	403	3.05	1.60	4.32	6	0.1
November-	54.0	33.3	43.6	77	13	187	3.28	1.98	4.48	8	2.3
December-	43.9	25.3	34.6	69	-1	66	3.44	2.25	4.45	8	7.1
Yearly:											
Average	62.5	40.7	51.6	---	---	---	----	----	----	---	---
Extreme	95	-20		92	-11	---	----	----	----	---	---
Total--	---	---	---	---	---	5,293	46.15	40.72	50.76	98	43.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 1B.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Beckley VA Hospital, West Virginia)

Month	Temperature (degrees F)						Precipitation (inches)				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temp. higher than--	Minimum temp. lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snow-fall
January--	39.9	20.2	30.0	65	-14	34	3.15	1.84	4.41	7	11.2
February-	44.6	22.6	33.6	70	-8	52	2.71	1.80	3.54	7	8.8
March----	53.6	29.3	41.4	79	2	156	3.20	1.86	4.29	8	5.9
April----	64.0	36.7	50.3	84	17	330	3.35	2.11	4.52	7	0.7
May------	71.7	45.6	58.7	86	26	577	4.17	2.53	5.75	9	0.0
June-----	76.6	54.0	65.3	86	35	760	3.55	2.31	4.63	8	0.0
July-----	79.4	58.2	68.8	89	42	882	4.52	2.89	6.06	8	0.0
August---	78.5	57.0	67.7	89	42	857	3.52	2.31	4.63	6	0.0
September	72.3	50.8	61.5	85	31	645	3.16	1.67	4.64	5	0.0
October--	63.2	39.2	51.2	79	19	355	2.51	1.18	3.71	5	0.0
November-	53.1	30.8	42.0	75	9	154	2.83	1.76	3.78	6	1.8
December-	43.8	23.9	33.9	68	-5	63	2.86	1.69	3.89	6	7.0
Yearly:											
Average	61.7	39.0	50.4	---	---	---	----	----	----	---	---
Extreme	96	-23	---	90	-17	---	----	----	----	---	---
Total--	---	---	---	---	---	4,863	39.54	33.84	43.57	82	35.4

* 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 1C.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Bluestone Lake, West Virginia)

Month	Temperature (degrees F)						Precipitation (inches)				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snow-fall
January--	40.6	22.5	31.5	68	-5	31	3.04	1.59	4.43	7	7.8
February-	45.4	24.5	35.0	72	2	55	2.67	1.50	3.84	6	5.6
March----	54.9	31.4	43.2	80	11	175	3.45	2.03	4.71	7	3.1
April----	65.5	39.2	52.3	86	24	380	3.27	1.97	4.48	7	0.4
May------	73.8	48.3	61.1	88	31	653	3.95	2.68	5.07	8	0.0
June-----	80.6	57.7	69.2	92	42	875	3.33	1.98	4.61	7	0.0
July-----	84.3	62.5	73.4	94	51	1,036	4.18	2.63	5.67	8	0.0
August---	83.1	61.8	72.4	94	50	1,005	3.36	2.37	4.33	6	0.0
September	76.8	55.3	66.0	91	39	781	2.83	1.36	4.22	5	0.0
October--	66.4	42.5	54.5	82	27	450	2.60	1.21	3.96	5	0.0
November-	54.9	33.3	44.1	77	17	182	2.52	1.58	3.37	5	0.8
December-	44.0	25.8	34.9	68	3	55	2.57	1.45	3.60	6	3.5
Yearly:											
Average	64.2	42.1	53.1	---	---	---	----	----	----	---	---
Extreme	99	-17	---	95	-8	---	----	----	----	---	---
Total--	---	---	---	---	---	5,679	37.77	34.06	41.11	77	21.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2A.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Oak Hill, West Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 14	Apr. 29	May 16
2 years in 10 later than--	Apr. 10	Apr. 23	May 10
5 years in 10 later than--	Apr. 2	Apr. 10	Apr. 28
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 18	Oct. 8	Sept. 28
2 years in 10 earlier than--	Oct. 25	Oct. 14	Oct. 2
5 years in 10 earlier than--	Nov. 7	Oct. 25	Oct. 11

Table 2B.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Beckley VA Hospital, West Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 2	May 12	May 31
2 years in 10 later than--	Apr. 26	May 8	May 24
5 years in 10 later than--	Apr. 14	Apr. 30	May 12
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 9	Oct. 1	Sept. 19
2 years in 10 earlier than--	Oct. 15	Oct. 5	Sept. 23
5 years in 10 earlier than--	Oct. 26	Oct. 12	Oct. 1

Table 2C.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Bluestone Lake, West Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 4	Apr. 22	May 12
2 years in 10 later than--	Mar. 29	Apr. 17	May 6
5 years in 10 later than--	Mar. 18	Apr. 7	Apr. 24
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 2	Oct. 18	Oct. 8
2 years in 10 earlier than--	Nov. 8	Oct. 24	Oct. 13
5 years in 10 earlier than--	Nov. 19	Nov. 4	Oct. 22

Table 3A.—Growing Season

(Recorded in the period 1971-2000 at Oak Hill, West Virginia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	193	172	141
8 years in 10	202	181	150
5 years in 10	218	197	166
2 years in 10	234	213	181
1 year in 10	243	222	190

Table 3B.—Growing Season

(Recorded in the period 1971-2000 at Beckley VA Hospital, West Virginia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	166	145	119
8 years in 10	175	151	126
5 years in 10	194	164	141
2 years in 10	212	176	155
1 year in 10	221	183	162

Table 3C.—Growing Season

(Recorded in the period 1971-2000 at Bluestone Lake, West Virginia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	221	186	158
8 years in 10	229	194	166
5 years in 10	245	211	181
2 years in 10	260	227	197
1 year in 10	269	236	205

Table 4.—Acres, Hectares, and Proportionate Extent of the Map Units

Map symbol	Map unit name	Acres	Hectares	Percent
AtA	Atkins loam, 0 to 3 percent slopes, frequently flooded	82	33	0.1
CaC	Cateache channery silt loam, 8 to 15 percent slopes	108	44	0.1
CbD	Cateache channery silt loam, 15 to 25 percent slopes, very stony	497	201	0.7
CbE	Cateache channery silt loam, 25 to 35 percent slopes, very stony	1,244	504	1.7
CcG	Cateache-Pipestem complex, 35 to 80 percent slopes, very stony	12,804	5,186	17.7
CfC	Cedarcreek very channery loam, 0 to 15 percent slopes, very stony	75	30	0.1
CgF	Cedarcreek-Rock outcrop complex, very steep, very stony	569	230	0.8
ChA	Chavies fine sandy loam, 0 to 3 percent slopes, rarely flooded	329	133	0.5
ClE	Clifftop channery silt loam, 25 to 35 percent slopes	1,487	602	2.1
CnB	Clifftop-Nallen complex, 3 to 8 percent slopes	350	142	0.5
CnC	Clifftop-Nallen complex, 8 to 15 percent slopes	2,098	850	2.9
CnD	Clifftop-Nallen complex, 15 to 25 percent slopes	2,174	880	3.0
CoA	Combs fine sandy loam, 0 to 3 percent slopes, occasionally flooded	198	80	0.3
CpA	Combs-Potomac complex, 0 to 3 percent slopes, very stony, occasionally flooded	293	119	0.4
CrB	Cookport-Nallen complex, 3 to 8 percent slopes	711	288	1.0
CtB	Cotaco loam, 3 to 8 percent slopes	149	60	0.2
CxA	Craigsville very gravelly sandy loam, 0 to 5 percent slopes, extremely stony, rarely flooded	370	150	0.5
DkC	Dekalb very channery loam, 3 to 15 percent slopes, extremely stony	19	8	*
DrE	Dekalb-Rock outcrop complex, 15 to 35 percent slopes, extremely stony	2,052	831	2.8
GaB	Gilpin loam, 3 to 8 percent slopes	11	4	*
GaC	Gilpin loam, 8 to 15 percent slopes	427	173	0.6
GaD	Gilpin loam, 15 to 25 percent slopes	710	288	1.0
GbE	Gilpin-Berks complex, 25 to 35 percent slopes, very stony	1,078	437	1.5
GhG	Gilpin-Highsplint-Berks complex, 35 to 90 percent slopes, extremely stony	1,871	758	2.6
HgE	Highsplint channery loam, 15 to 35 percent slopes, very stony	6	2	*
ImC	Itmann very channery sandy loam, 0 to 15 percent slopes	6	2	*
ImF	Itmann very channery sandy loam, very steep	44	18	*
KmC	Kaymine very channery loam, 0 to 15 percent slopes, very stony	106	43	0.1
KrF	Kaymine-Rock outcrop complex, very steep, very stony	1,833	742	2.5
KwA	Knowlton loam, 0 to 3 percent slopes, rarely flooded	9	4	*
LaC	Laidig channery loam, 3 to 15 percent slopes, rubbly	2,490	1,008	3.5
LeF	Layland-Dekalb-Guyandotte complex, 35 to 70 percent slopes, extremely stony	5,482	2,220	7.6
LgG	Layland-Dekalb-Rock outcrop complex, 55 to 80 percent slopes, extremely stony	16,127	6,531	22.3
LhE	Layland-Laidig complex, 15 to 35 percent slopes, rubbly	4,999	2,025	6.9
LlB	Lily loam, 3 to 8 percent slopes	90	36	0.1
LlC	Lily loam, 8 to 15 percent slopes	43	17	*
LrA	Lithic Hapludolls-Rock outcrop complex, 0 to 3 percent slopes, rubbly, rarely flooded	12	5	*
LxG	Lithic Udorthents-Rock outcrop complex, cut land, 5 to 100 percent slopes	146	59	0.2
NfC	Nallen-Fenwick complex, 8 to 15 percent slopes, very stony	2,566	1,039	3.6
PhA	Philo-Pope complex, 0 to 3 percent slopes, occasionally flooded	34	14	*
PkC	Pipestem channery silty clay loam, 3 to 15 percent slopes, very stony	738	299	1.0
PmE	Pipestem channery silty clay loam, 15 to 35 percent slopes, extremely stony	2,912	1,179	4.0

See footnote at end of table.

Table 4.—Acres, Hectares, and Proportionate Extent of the Map Units

Map symbol	Map unit name	Acres	Hectares	Percent
PxA	Potomac-Nelse complex, 0 to 5 percent slopes, extremely stony, frequently flooded	478	194	0.7
Qs	Quarry, sandstone	87	35	0.1
Rw	Riverwash, frequently flooded	209	85	0.3
UgC	Udorthents, graded, 0 to 15 percent slopes	230	93	0.3
UgF	Udorthents, graded, 15 to 55 percent slopes	80	32	0.1
Ur	Udorthents, railroad grade	978	396	1.4
Uu	Udorthents-Urban land complex, highways	226	92	0.3
W	Water	2,523	1,022	3.5
	Total	72,160	29,225	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	Corn	Grass-legume hay	Kentucky bluegrass	Oats	Wheat
		Bu	Tons	AUM	Bu	Bu
AtA:		---	---	---	---	---
Atkins, frequently flooded	5w					
CaC:		90.00	3.00	4.50	65.00	35.00
Cateache	3e					
CbD:		---	---	3.00	---	---
Cateache	6s					
CbE:		---	---	2.50	---	---
Cateache	6s					
CcG:		---	---	---	---	---
Cateache	7s					
Pipestem	7s					
CfC:		---	---	2.50	---	---
Cedarcreek, bench	6s					
CgF:		---	---	---	---	---
Cedarcreek, outslope	7s					
Cedarcreek, bench	6s					
Rock outcrop, highwall	8s					
ChA:		130.00	3.50	5.50	75.00	45.00
Chavies, rarely flooded	1					
ClE:		---	---	---	---	---
Clifftop	6e					
CnB:		85.00	2.80	4.30	62.00	38.00
Clifftop	2e					
Nallen	2e					
CnC:		80.00	2.80	4.30	57.00	33.00
Clifftop	3e					
Nallen	3e					
CnD:		69.00	2.30	3.80	51.00	28.00
Clifftop	4e					
Nallen	4e					
CoA:		135.00	4.50	6.00	75.00	60.00
Combs, occasionally flooded	2w					

Table 5.—Land Capability and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Corn	Grass-legume hay	Kentucky bluegrass	Oats	Wheat
		Bu	Tons	AUM	Bu	Bu
CpA:		85.00	2.25	3.50	60.00	30.00
Combs, occasionally flooded	4s					
Potomac, occasionally flooded	4s					
CrB:		81.00	2.90	4.30	58.00	35.00
Cookport	2e					
Nallen	2e					
CtB:		115.00	3.00	4.50	75.00	40.00
Cotaco	2e					
CxA:		---	---	---	---	---
Craigsville, rarely flooded	7s					
DkC:		---	---	---	---	---
Dekalb	7s					
DrE:		---	---	---	---	---
Dekalb	7s					
Rock outcrop	8s					
GaB:		90.00	3.00	4.50	65.00	40.00
Gilpin	2e					
GaC:		85.00	3.00	4.50	60.00	35.00
Gilpin	3e					
GaD:		80.00	2.50	4.00	55.00	30.00
Gilpin	4e					
GbE:		---	---	3.00	---	---
Gilpin	6s					
Berks	6s					
GhG:		---	---	---	---	---
Gilpin	7s					
Highsplint	7s					
Berks	7s					
HgE:		---	---	3.00	---	---
Highsplint	6s					
ImC:		---	---	---	---	---
Itmann	7s					
ImF:		---	---	---	---	---
Itmann	7s					
KmC:		---	---	3.00	---	---
Kaymine, bench	6s					

Table 5.—Land Capability and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Corn	Grass-legume hay	Kentucky bluegrass	Oats	Wheat
		Bu	Tons	AUM	Bu	Bu
KrF:		---	---	---	---	---
Kaymine, outslope	7s					
Kaymine, bench	6s					
Rock outcrop, highwall	8s					
KwA:		100.00	3.00	4.50	---	35.00
Knowlton, rarely flooded	4w					
LaC:		---	---	---	---	---
Laidig	7s					
LeF:		---	---	---	---	---
Layland	7s					
Dekalb	7s					
Guyandotte	7s					
LgG:		---	---	---	---	---
Layland	7s					
Dekalb	7s					
Rock outcrop	8s					
LhE:		---	---	---	---	---
Layland	7s					
Laidig	7s					
LlB:		95.00	3.50	4.50	65.00	40.00
Lily	2e					
LlC:		85.00	3.00	4.50	60.00	35.00
Lily	3e					
LrA:		---	---	---	---	---
Lithic Hapludolls, rarely flooded	7s					
Rock outcrop	8s					
LxG:		---	---	---	---	---
Lithic Udorthents, cut land	8s					
Rock outcrop	8s					
NfC:		---	---	4.10	---	---
Nallen	6s					
Fenwick	6s					
PhA:		120.00	3.30	5.10	76.00	43.00
Philo, occasionally flooded	2w					
Pope, occasionally flooded	2w					

Table 5.—Land Capability and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Corn	Grass-legume hay	Kentucky bluegrass	Oats	Wheat
		Bu	Tons	AUM	Bu	Bu
PkC:		---	---	4.50	---	---
Pipestem----------------	6s					
PmE:		---	---	---	---	---
Pipestem----------------	7s					
PxA:		---	---	3.00	---	---
Potomac, frequently flooded----------------	5w					
Nelse, frequently flooded----------------	5w					
Qs:		---	---	---	---	---
Quarry, sandstone-------	8s					
Rw:		---	---	---	---	---
Riverwash, frequently flooded----------------	8w					
UgC:		---	---	---	---	---
Udorthents, graded------	7e					
UgF:		---	---	---	---	---
Udorthents, graded------	8e					
Ur:		---	---	---	---	---
Udorthents, railroad grade------------------	8e					
Uu:		---	---	---	---	---
Udorthents, highways----	8e					
Urban land, highways----	8s					
W.						
Water						

Table 6.—Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are indicated in the column "Farmland classification")

Map unit symbol	Map unit name	Farmland classification
ChA	Chavies fine sandy loam, 0 to 3 percent slopes, rarely flooded	All areas are prime farmland
CnB	Clifftop-Nallen complex, 3 to 8 percent slopes	All areas are prime farmland
CoA	Combs fine sandy loam, 0 to 3 percent slopes, occasionally flooded	All areas are prime farmland
CrB	Cookport-Nallen complex, 3 to 8 percent slopes	All areas are prime farmland
CtB	Cotaco loam, 3 to 8 percent slopes	All areas are prime farmland
GaB	Gilpin loam, 3 to 8 percent slopes	All areas are prime farmland
LlB	Lily loam, 3 to 8 percent slopes	All areas are prime farmland
PhA	Philo-Pope complex, 0 to 3 percent slopes, occasionally flooded	All areas are prime farmland
NfC	Nallen-Fenwick complex, 8 to 15 percent slopes, very stony	Farmland of local importance
CaC	Cateache channery silt loam, 8 to 15 percent slopes	Farmland of statewide importance
CnC	Clifftop-Nallen complex, 8 to 15 percent slopes	Farmland of statewide importance
CnD	Clifftop-Nallen complex, 15 to 25 percent slopes	Farmland of statewide importance
GaC	Gilpin loam, 8 to 15 percent slopes	Farmland of statewide importance
GaD	Gilpin loam, 15 to 25 percent slopes	Farmland of statewide importance
LlC	Lily loam, 8 to 15 percent slopes	Farmland of statewide importance

Table 7.—Hydric Soils

(This report lists only those map unit components that are rated as hydric. Definitions of hydric criteria codes are included at the bottom of the report)

Map unit symbol and map unit name	Component	Percent of map unit	Hydric rating	Landform	Hydric soils criteria: Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
AtA:								
Atkins loam, 0 to 3 percent slopes, frequently flooded	Atkins, frequently flooded	75	Yes	flood plains in mountain valleys	2B3	Yes	No	No
KwA:								
Knowlton loam, 0 to 3 percent slopes, rarely flooded	Knowlton, rarely flooded	70	Yes	rarely flooded, low stream terraces in mountain valleys	2B3	Yes	No	No

Explanation of hydric criteria codes:

1. All Histels (except for Folistels), and Histosols (except for Folists), which are, by definition, saturated.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   - B. are poorly drained or very poorly drained and have either:
     - 1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
     - 2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
     - 3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for periods of long or very long duration during the growing season.
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class

(Component percents may not add up to 100. MAP is the mean annual precipitation)

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
AtA:								
Atkins, frequently flooded	75	0-3	550-801	1034-1289	Mountains	Flood plain in mountain valley	Acid loamy alluvium derived from interbedded sedimentary rock	Wetlands (W3)
CaC:								
Cateache	75	8-15	393-766	865-1044	Mountains	Ridge and structural bench	Nonacid fine-loamy residuum weathered from shale and siltstone	Limy Uplands (LU2)
CbD:								
Cateache	75	15-25	391-799	865-1044	Mountains	Ridge and structural bench	Nonacid fine-loamy residuum weathered from shale and siltstone	Very Rocky, Limy Soils (RL2)
CbE:								
Cateache	75	25-35	379-940	865-1044	Mountains	Mountain slope	Nonacid fine-loamy residuum weathered from shale and siltstone	Very Rocky, Limy Soils (RL2)
CcG:								
Cateache	40	35-80	316-939	865-1044	Mountains	Mountain slope	Nonacid fine-loamy residuum weathered from shale and siltstone	Not Suited (NS)
Pipestem	40	35-80	316-939	865-1044	Mountains	Mountain slope	Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock	Not Suited (NS)
CfC:								
Cedarcreek, bench	75	0-15	620-790	901-1055	Mountains	Surface mine on mountain slope	Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
CgF:								
Cedarcreek, outslope	40	25-60	592-813	901-1055	Mountains	Surface mine on mountain slope	Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock	Not Suited (NS)
Cedarcreek, bench	35	0-15	592-813	901-1055	Mountains	Surface mine on mountain slope	Loamy-skeletal, acid coal extraction mine spoil derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)
Rock outcrop, highwall	15	None assigned	592-813	901-1055	Mountains	Exposed surface mine highwall cliff	Acid interbedded sedimentary rock	Not Suited (NS)
ChA:								
Chavies, rarely flooded	75	0-3	311-419	865-1044	Mountains	Flood plain in river valley	Coarse-loamy alluvium derived from interbedded sedimentary rock	Fertile Loams (FL2)
ClE:								
Clifftop	70	25-35	357-945	1034-1289	Mountains	Convex mountain slope	Acid fine-loamy residuum weathered from shale and siltstone	Acid Hills (AH3)
CnB:								
Clifftop	55	3-8	505-950	1034-1289	Mountains	Ridge	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL2)
Nallen	30	3-8	505-950	1034-1289	Mountains	Ridge	Acid coarse-loamy residuum weathered from sandstone	Acid Loams (AL3)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
CnC:								
Clifftop	50	8-15	384-968	1034-1289	Mountains	Ridge	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL3)
Nallen	35	8-15	384-968	1034-1289	Mountains	Ridge	Acid coarse-loamy residuum weathered from sandstone	Acid Loams (AL3)
CnD:								
Clifftop	55	15-25	359-947	1034-1289	Mountains	Ridge	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL3)
Nallen	25	15-25	359-947	1034-1289	Mountains	Ridge	Acid coarse-loamy residuum weathered from sandstone	Acid Loams (AL3)
CoA:								
Combs, occasionally flooded	85	0-3	302-411	865-1044	Mountains	Flood plain in river valley	Recent coarse-loamy alluvium derived from interbedded sedimentary rock	Moist Loams (ML2)
CpA:								
Combs, occasionally flooded	45	0-3	250-411	865-1044	Mountains	High-energy flood plain in river valley	Nonacid coarse-loamy alluvium derived from interbedded sedimentary rock	Moist Loams (ML2)
Potomac, occasionally flooded	35	0-3	250-411	865-1044	Mountains	High-energy flood plain in river valley	Skeletal, nonacid sandy alluvium derived from interbedded sedimentary rock	Sands (SA3)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
CrB:								
Cookport	50	3-8	509-966	1034-1289	Mountains	Broad ridge	Fine-loamy residuum weathered from sandstone and shale	Acid Loams (AL3)
Nallen	35	3-8	509-966	1034-1289	Mountains	Broad ridge	Acid coarse-loamy residuum weathered from sandstone	Acid Loams (AL3)
CtB:								
Cotaco	75	3-8	553-768	1034-1289	Mountains	Low stream terrace on mountain	Old loamy alluvium derived from sandstone and shale	Acid Loams (AL3)
CxA:								
Craigsville, rarely flooded	90	0-5	256-491	865-1044	Mountains	Alluvial fan in river valley	Loamy-skeletal alluvium derived from sandstone and shale	Acid Loams (AL2)
DkC:								
Dekalb	80	3-15	558-649	1034-1289	Mountains	Ridge	Acid loamy residuum weathered from sandstone	Very Rocky, Acid Soils (RA3)
DrE:								
Dekalb	55	15-35	323-953	1034-1289	Mountains	Mountain slope	Acid loamy residuum weathered from sandstone	Not Suited (NS)
Rock outcrop	15	None assigned	323-953	1034-1289	Mountains	Sandstone cliff	Sandstone	Not Suited (NS)
GaB:								
Gilpin	80	3-8	619-738	865-1044	Mountains	Ridge and structural bench	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL2)
GaC:								
Gilpin	70	8-15	652-931	865-1044	Mountains	Ridge and structural bench	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL2)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
GaD:								
Gilpin	70	15-25	583-834	865-1044	Mountains	Ridge and structural bench	Acid fine-loamy residuum weathered from shale and siltstone	Acid Loams (AL2)
GbE:								
Gilpin	60	25-35	529-1004	865-1044	Mountains	Mountain slope	Acid fine-loamy residuum weathered from shale and siltstone	Very Rocky, Acid Soils (RA2)
Berks	20	25-35	529-1004	865-1044	Mountains	Mountain slope	Residuum weathered from interbedded sedimentary rock	Dry Uplands (DU2)
GhG:								
Gilpin	45	35-90	500-977	865-1044	Mountains	Mountain slope	Acid fine-loamy residuum weathered from shale and siltstone	Not Suited (NS)
Highsplint	25	35-90	500-977	865-1044	Mountains	Mountain slope	Loamy-skeletal colluvium derived from interbedded sedimentary rock	Not Suited (NS)
Berks	20	35-90	500-977	865-1044	Mountains	Mountain slope	Residuum weathered from interbedded sedimentary rock	Not Suited (NS)
HgE:								
Highsplint	70	15-35	349-588	865-1349	Mountains	Mountain slope	Very stony colluvium derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)
ImC:								
Itmann	100	0-15	575-595	1034-1289	Mountains	Spoil piles on mountain slope	Nonacid, carbonaceous, coal extraction mine spoil	Not Suited (NS)
ImF:								
Itmann	100	35-70	548-592	1034-1289	Mountains	Spoil piles on mountain slope	Nonacid, carbonaceous, coal extraction mine spoil	Not Suited (NS)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
KmC:								
Kaymine, bench-----	70	0-15	532-867	1034-1289	Mountains	Surface mine on contour slope on mountain slope	Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone	Very Rocky, Limy Soils (RL2)
KrF:								
Kaymine, outslope--	35	25-60	262-862	1034-1289	Mountains	Surface mine on mountain slope	Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone	Not Suited (NS)
Kaymine, bench-----	35	0-15	262-862	1034-1289	Mountains	Surface mine on contour bench on mountain slope	Loamy-skeletal, nonacid coal extraction mine spoil derived from shale and siltstone	Very Rocky, Limy Soils (RL2)
KwA:								
Knowlton, rarely flooded-----------	70	0-3	575-624	1034-1289	Mountains	Rarely flooded, low stream terrace in mountain valley	Loamy alluvium derived from interbedded sedimentary rock	Wetlands (W2)
LaC:								
Laidig-------------	70	3-15	473-962	1034-1289	Mountains	Mountain slope	Rubbly colluvium derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)
LeF:								
Layland------------	45	35-55	433-967	1034-1289	Mountains	Mountain slope	Extremely stony, acid colluvium derived from interbedded sedimentary rock	Not Suited (NS)
Dekalb-------------	30	35-70	433-967	1034-1289	Mountains	Convex mountain slope and ridge	Acid loamy residuum weathered from sandstone	Not Suited (NS)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
LeF:								
Guyandotte	15	35-55	433-967	1034-1289	Mountains	Mountain slope	Loamy-skeletal colluvium derived from interbedded sedimentary rock	Not Suited (NS)
LgG:								
Layland	45	55-80	250-874	1034-1289	Mountains	Mountain slope	Extremely stony, acid colluvium derived from interbedded sedimentary rock	Not Suited (NS)
Dekalb	30	55-80	250-874	1034-1289	Mountains	Convex mountain slope	Acid loamy residuum weathered from sandstone	Not Suited (NS)
Rock outcrop	10	None assigned	250-874	1034-1289	Mountains	Sandstone escarpment	Sandstone	Not Suited (NS)
LhE:								
Layland	60	15-35	264-936	1034-1289	Mountains	Mountain slope	Rubbly, acid colluvium derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)
Laidig	25	15-35	264-936	1034-1289	Mountains	Mountain slope	Rubbly colluvium derived from interbedded sedimentary rock	Very Rocky, Acid Soils (RA3)
LlB:								
Lily	70	3-8	658-800	865-1044	Mountains	Ridge and structural bench	Acid fine-loamy residuum weathered from sandstone	Acid Loams (AL2)
LlC:								
Lily	70	8-15	637-818	865-1044	Mountains	Ridge and structural bench	Acid fine-loamy residuum weathered from sandstone	Acid Loams (AL2)
LrA:								
Lithic Hapludolls, rarely flooded	80	0-3	393-397	865-1044	River valley	Rarely flooded strath terrace	Gravelly alluvium derived from interbedded sedimentary rock	Not Suited (NS)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
LrA:								
Rock outcrop	20	None assigned	393-397	865-1044	River valley	Rarely flooded strath terrace	Sandstone	Not Suited (NS)
LxG:								
Lithic Udorthents, cut land	50	5-100	396-866	865-1346	Mountains	Drastically disturbed areas on mountain slope	Cut and fill materials derived from native soils and interbedded sedimentary rock	Not Suited (NS)
NfC:								
Nallen	65	8-15	508-909	1034-1289	Mountains	Broad ridge	Acid coarse-loamy residuum weathered from sandstone	Very Rocky, Acid Soils (RA3)
Fenwick	15	8-15	508-909	1034-1289	Mountains	Broad ridge	Acid fine-loamy residuum weathered from sandstone and shale	Very Rocky, Acid Soils (RA3)
PhA:								
Philo, occasionally flooded	50	0-3	547-730	943-1289	Mountains	Flood plain in mountain valley	Acid coarse-loamy alluvium derived from sandstone and shale	Acid Loams (AL3)
Pope, occasionally flooded	30	0-3	547-730	943-1289	Mountains	Flood plain in mountain valley	Acid coarse-loamy alluvium derived from sandstone and shale	Acid Loams (AL3)
PkC:								
Pipestem	85	3-15	317-718	865-1044	Mountains	Mountain slope	Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock	Very Rocky, Limy Soils (RL2)
PmE:								
Pipestem	80	15-35	309-933	865-1044	Mountains	Mountain slope	Reddish brown silty and clayey colluvium derived from interbedded sedimentary rock	Very Rocky, Limy Soils (RL2)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
PxA:								
Potomac, frequently flooded	60	0-5	301-409	865-1044	Mountains	High-energy flood plain in river valley	Skeletal, nonacid sandy alluvium derived from interbedded sedimentary rock	Sands (SA3)
Nelse, frequently flooded	20	0-5	301-409	865-1044	Mountains	High-energy flood plain in river valley	Nonacid sandy alluvium derived from interbedded sedimentary rock	Moist Loams (ML3)
Qs:								
Quarry, sandstone	100	None assigned	782-898	1034-1289	None assigned	None assigned	Acid sandstone	Not Suited (NS)
Rw:								
Riverwash, frequently flooded	95	0-3	260-401	865-1346	Mountains	Sand and cobble bars along the river on high-energy flood plain in river valley	Sandy and gravelly alluvium derived from interbedded sedimentary rock	Not Suited (NS)
UgC:								
Udorthents, graded	85	0-15	314-759	865-1346	Mountains	None assigned	Cut and fill materials derived from native soils and interbedded sedimentary rock	Not Suited (NS)
UgF:								
Udorthents, graded	85	15-55	256-789	865-1346	Mountains	None assigned	Cut and fill materials derived from native soils and interbedded sedimentary rock	Not Suited (NS)

Table 8.—Landscape, Parent Material, and West Virginia Grassland Suitability Class—Continued

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	WV grassland suitability class name and number
	Pct	Pct	Meters	mm				
Ur:								
Udorthents, railroad grade	93	0-70	252-607	865-1346	None assigned	None assigned	Cut and fill materials derived from native soils and interbedded sedimentary rock	Not Suited (NS)
Uu:								
Udorthents, highways	70	0-7	386-842	865-1346	Mountains	None assigned	Cut and fill materials derived from native soils and interbedded sedimentary rock	Not Suited (NS)
Urban land, highways	25	0-7	386-842	865-1346	Mountains	None assigned	None assigned	Not Suited (NS)
W:								
Water	100	None assigned	250-414	865-1346	Mountains	River valley	None assigned	None assigned

Table 9.—Vegetation Community Types and U.S. National Vegetation Classification (USNVC) in New River Gorge National River

Community type name	USNVC association name and code	Comments
UPLAND FORESTS AND WOODLANDS:		
Chinquapin Oak – Black Maple Forest	*Quercus muehlenbergii – Quercus (alba, rubra) – Carya cordiformis / Viburnum prunifolium* Forest [CEGL004793]	Additional small patches likely within the Oak – Hickory – Sugar Maple Forest and Sugar Maple - Yellow Buckeye – American Basswood Forest map classes.
Cliff Top Pitch Pine Woodland	*Pinus rigida – Quercus coccinea / Vaccinium angustifolium* Woodland [CEGL006557]	Small patch type with discrete boundaries.
Cliff Top Virginia Pine Forest	*Pinus virginiana – Pinus (rigida, echinata) – (Quercus pinus) / Vaccinium pallidum* Forest [CEGL007119]	Small patch type with discrete boundaries.
Deciduous Tree / Great Laurel Forest	*Betula lenta - Liriodendron tulipifera – Acer rubrum / Rhododendron maximum* Forest [CELT007543]	Local subtype of same association as the Eastern Hemlock – Sweet Birch - Tuliptree / Great Laurel Forest map class.
Eastern Hemlock – Chestnut Oak / Catawba Rhododendron Forest	*Quercus prinus / Rhododendron catawbiense - Kalmia latifolia* Forest [CEGL008524]	Small patch type with discrete boundaries.
Eastern Hemlock – Sweet Birch – Tuliptree / Great Laurel Forest	*Liriodendron tulipifera – Betula lenta – Tsuga canadensis / Rhododendron maximum* Forest [CEGL007543]	Same association as the Deciduous Tree / Great Laurel Forest map class.
Oak / Ericad Forest	*Quercus (prinus, coccinea) / Kalmia latifolia / (Galax urceolata, Gaultheria procumbens)* Forest [CEGL006271]	Grades to Oak – Hickory Forest on less dry sites.
Oak – Hickory Forest	*Quercus prinus – (Quercus rubra) – Carya* spp. */ Oxydendrum arboreum - Cornus florida* Forest [CEGL007267]	Grades to Oak / Ericad Forest on drier sites and Oak – Hickory – Sugar Maple Forest on less dry sites.
Oak – Hickory – Sugar Maple Forest	*Quercus prinus – Carya ovata - Quercus rubra / Acer saccharum* Forest [CEGL007268]	Grades to Oak – Hickory Forest on drier sites and Sugar Maple - Yellow Buckeye – American Basswood Forest on wetter sites.
Successional Black Locust Woodland	*Robinia pseudoacacia* Forest [CEGL007279]	Additional patches likely within the Disturbed Area and Strip Mine Reclamation map classes.
Successional Eastern White Forest	*Pinus strobis* Successional Forest [CEGL007944]	Small patch type with discrete boundaries.

Table 9.—Vegetation Community Types and U.S. National Vegetation Classification (USNVC) in New River Gorge National River—Continued

Community type name	USNVC association name and code	Comments
UPLAND FORESTS AND WOODLANDS - Continued:		
Successional Tuplip Tree Forest	*Liriodendron tulipifera – Quercus* spp. Forest [CEGL007221], *Liriodendron tulipifera / (Cercis canadensis) / (Lindera benzoin)* Forest [CEGL007220]	CEGL007221 occurs on drier sites more abundant on plateaus. CEGL007220 occurs on wetter sites more abundant on gorge slopes. Additional patches likely within the Distrubed Area, Strip Mine Reclamation, and Sugar Maple – Yellow Buckeye - American Basswood Forest map classes.
Successional Virgin Pine Forest	*Pinus virginiana* Successional Forest [CEGL002591]	Small patch type with discrete boundaries.
Sugar Maple – Yellow Buckeye – American Basswood Forest	*Liriodendron tulipifera – Tilia americana* var. *heterophylla - Aesculus flava – Acer saccharum / (Magnolia tripetala)* Forest [CEGL005222], *Liriodendron tulipfera / (Cercis canadensis) / (Lindera benzoin)* Forest [CEGL007220]	Predominantly CEGL005222 but probably includes patches of CEGL007220 on shaded, north slopes not distinguishable on aerial imagery. Grades to Oak – Hickory – Sugar Maple Forest on drier sites.
Yellow Birch Cold Cove Forest	*Betula alleghaniensis – (Tsuga canadensis) / Rhododendron maximum / Leucothoe fontanesiana* Forest [CEGL007861]	Grades to Deciduous Tree / Great Laurel Forest and Eastern Hemlock - Sweet Birch – Tuliptree / Great Laurel Forest.
LICHEN AND SPARSE VEGETATION:		
Cliff	Appalachian – Alleghenian Sandstone Dry Cliff Sparse Vegetation [CEGL006435], *Umbilicaria mammulata* Nonvascular Vegetation [CEGL004387]	CEGL006435 is more likely to occur on south aspects and on cliffs without seepage. CEGL004387 is more likely to occur on north aspects and on cliffs with seepage. Additional small cliffs likely in all map classes on gorge slopes.
RIPARIAN COMMUNITIES:		
American Water-willow Cobble Bar	*Justicia americana* Herbaceous Vegetation [CEGL004286]	Additional patches within Steep Riparian Edge.
Backwater Slough	*Peltandra virginica – Saururus cernuus – Boehmeria cylindrical / Climacium americanum* Herbaceous Vegetation [CEGL007696]	May include areas of standing water and unvegetated mud.

Table 9.—Vegetation Community Types and U.S. National Vegetation Classification (USNVC) in New River Gorge National River—Continued

Community type name	USNVC association name and code	Comments
RIPARIAN COMMUNITIES – Continued:		
Black Willow Slackwater Woodland	*Salix nigra – Betula nigra / Schoenoplectus pungens* Wooded Herbaceous Vegetation [CEGL006463]	Additional patches within Steep Riparian Edge.
Cobble	No USNVC association	Natural disturbance feature.
Eastern Red-cedar – Virginia Pine Flatrock Woodland	*Juniperus virginiana var. virginiana - Pinus virginiana - Quercus stellata / Amelanchier stolonifera / Danthonia spicata – Melica mutica* Woodland [CEGL008449]	Small patch type with discrete boundaries.
Flatrock Pavement	No USNVC association	Natural disturbance feature.
Oak – Tuliptree / Mountain Silverbell Floodplain Forest	*Quercus (alba, rubra, velutina) / Halesia tetraptera* Forest [CEGL006462]	Additional patches within Steep Riparian Edge.
Riverbank Tall Herbs	*Verbesina alternifolia – Teucrium canadense – Elymus riparius – (Solidago gigantean)* Herbaceous Vegetation [CEGL006480]	Additional patches within Steep Riparian Edge.
Riverscour Prairie	*Andropogon gerardii – Panicum virgatum – Baptisia australis* Herbaceous Vegetation [CEGL006283]	Additional patches within Steep Riparian Edge.
Silver Maple Floodplain Forest	*Acer saccharinum – Ulmus americana* Forest [CEGL002586]	Additional patches within Steep Riparian Edge.
Steep Riparian Edge	*Salix nigra – Betula nigra / Schoenoplectus pungens* Wooded Herbaceous Vegetation [CEGL006463], *Quercus (alba, rubra, velutina) / Halesia tetraptera* Forest [CEGL006462], *Eragrostis hypnoides – Ludwigia palustris – Lindernia dubia – Cyperus squarrosus* Herbaceous Vegetation [CEGL006483], *Verbesina alternifolia – Teucrium canadense – Elymus riparius – (Solidago gigantea)* Herbaceous Vegetation [CEGL006480], *Andropogon gerardii - Panicum virgatum – Baptisia australis* Herbaceous Vegetation [CEGL006283], *Acer saccharinum – Ulmus americana* Forest [CEGL002586], *Acer negundo* Forest [CEGL005033], *Platanus occidentalis – Fraxinus pennsylvanica / Carpinus caroliniana / Verbesina alternifolia* Forest [CEGL006458], *Platanus occidentalis – (Betula nigra, Salix* spp.*)* Temporarily Flooded Woodland [CEGL003725], *Justicia americana* Herbaceous Vegetation [CEGL004286]	Narrow zone with one to several riparian associations often compressed along a steep elevational gradient without clear boundaries between associations. May also include narrow patches of vegetation which can be distinguished as individual associations. The most abundant associations are probably CEGL006458 and CEGL003725. The upper part of polygons may grade towards the adjacent upland association. Disturbed areas may often be included, especially where polygons are located between the river and a railroad or road.
Successional Box-elder Forest	*Acer negundo* Forest [CEGL005033]	Additional patches within Steep Riparian Edge.
Sycamore – Ash Floodplain Forest	*Platanus occidentalis – Fraxinus pennsylvanica / Carpinus caroliniana / Verbesina alternifolia* Forest [CEGL006458]	Additional patches within Steep Riparian Edge.

Table 9.—Vegetation Community Types and U.S. National Vegetation Classification (USNVC) in New River Gorge National River—Continued

Community type name	USNVC association name and code	Comments
RIPARIAN COMMUNITIES - Continued:		
Sycamore - River Birch Riverscour Woodland	*Platanus occidentalis - (Betula nigra, Salix* spp.*)* Temporarily Flooded Woodland [CEGL003725]	Additional patches within Steep Riparian Edge.
Tributary Floodplain Forest	No USNVC association	Local placeholder type.
HEADWATER WETLANDS:		
Beaver-influenced Wetland	*Alnus serrulata* Saturated Southern Shrubland [CEGL003912], *Sparganium americanum - Epilobium leptophyllum* Herbaceous Vegetation [CEGL004510], *Leersia oryzoides - Saggitaria latifolia* Herbaceous Vegetation [CEGL006461], *Hypericum densiflorum / Rubus hispidus* Shrubland [CEGL006464]	Vegetation complex, usually with patchy mosaic of two or more associations. May also include open water.
Forest Seep	*Acer rubrum - Nyssa sylvatica / Ilex verticillata - Vaccinium fuscatum / Osmunda cinnamomea* Forest [CEGL007853]	Additional small patches most likely on plateaus in Oak - Hickory Forest map class.
AQUATIC FEATURES:		
Creek	May include small patches of *Carex torta* Herbaceous Vegetation [CEGL004103]	Mapped where visible on aerial imagery with small gaps interpolated.
Pond	No USNVC association	
River	May include small patches of *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Vegetation [CEGL004725] and *Justicia americana* Herbaceous Vegetation [CEGL004286]	
CULTURAL AND DISTURBED AREAS:		
Developed Area	May include small patches of *Lolium (arundinaceum, pratense)* Herbaceous Vegetation [CEGL004048], *Pinus strobes* Planted Forest [CEGL007178]	Area maintained by human activities. Includes farms, residential areas, recreational areas, commercial areas, and industrial areas. Does not include strip mines.
Disturbed Area	May include patches of *Lolium (arundinaceum, pratense)* Herbaceous Vegetation [CEGL004048], *Robinia pseudoacacia* Forest [CEGL007279], *Lirodendron tulipifera - Quercus* spp. Forest [CEGL007221], *Lirodendron tulipfera / (Cercis canadensis) / (Lindera benzoin)* Forest [CEGL007220], *Pinus strobus* Successional Forest [CEGL007944], and degraded examples of natural vegetation types.	Area recently disturbed, but not maintained, by human activities. May include patches of semi-natural associations and degraded examples of natural associations. Does not include strip mines.

Table 9.—Vegetation Community Types and U.S. National Vegetation Classification (USNVC) in New River Gorge National River—Continued

Community type name	USNVC association name and code	Comments
CULTURAL AND DISTURBED AREAS - Continued		
Kudzu Patch	*Pueraria montana* var. *lobata* Vine-Shrubland [CEGL003882]	
Pine Plantation	*Pinus strobus* Planted Forest [CEGL007178]	Additional small patches in Developed Area and Strip Mine Reclamation map classes.
Strip Mine Reclamation	May include patches of *Lolium (arundinaceum, pratense)* Herbaceous Vegetation [CEGL004048], *Pinus strobus* Planted Forest [CEGL007178], *Robinia pseudoacacia* Forest [CEGL007279], *Lirodendron tulipifera - Quercus* spp. Forest [CEGL007221], *Liriodendron tulipifera / (Cercis canadensis) / (Lindera benzoin)* Forest [CEGL007220], *Pinus* strobus Successional Forest [CEGL007944]	Areas disturbed in the past by strip mining. Includes semi-natural successional communities, reclamation plantings, bare ground, and roads. Larger patches of Pine Plantations are mapped as a distinct map class.
Tipple	No USNVC association	
Utility Corridor	May include patches of *Lolium (arundinaceum, pratense)* Herbaceous Vegetation [CEGL004048]	Herbaceous and shrub physiognomy usually maintained by humans (herbicides, cutting).
Washout	No USNVC association	
TRANSPORTATION FEATURES:		
Bridge	No USNVC association	
Railroad	No USNVC association	
Road	No USNVC association	

Table 10.—Forest Productivity

(Characteristic trees are from the National Soil Information System (NASIS) component forest productivity table. The site index base age indicates the age used for the site curves. The volume of wood fiber is the yield likely to be produced by the most important tree species at the age of culmination of the mean annual increment (CMAI). The volume is the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. Only the map unit components suitable for forest production are listed)

Map unit symbol and soil name	Potential productivity: Characteristic trees	Potential productivity: Site index base age	Potential productivity: Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
AtA:				
Atkins, frequently flooded	green ash	---	---	---
	eastern cottonwood	30	105	143
	pin oak	50	80	62
	American sycamore	---	---	---
	red maple	---	---	---
CaC:				
Cateache	yellow-poplar	50	90	---
	northern red oak	50	80	62
	black cherry	50	80	50
	cucumbertree	50	80	71
	sugar maple	50	80	50
CbD:				
Cateache	yellow-poplar	50	90	---
	northern red oak	50	80	62
	black cherry	50	80	50
	cucumbertree	50	80	71
	sugar maple	50	80	50
CbE:				
Cateache	yellow-poplar	50	90	---
	northern red oak	50	80	62
	black cherry	50	80	50
	cucumbertree	50	80	71
	sugar maple	50	80	50
CcG:				
Cateache	yellow-poplar	50	90	---
	northern red oak	50	80	62
	black cherry	50	80	50
	cucumbertree	50	80	71
	sugar maple	50	80	50
Pipestem	northern red oak	50	85	67
	yellow-poplar	50	107	119
	black cherry	---	---	---
	American beech	---	---	---
	sugar maple	---	---	---
CfC:				
Cedarcreek, bench	black locust		100	---
	eastern white pine	50	94	174
	northern red oak	50	80	62
	yellow-poplar	50	105	115

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Characteristic trees	Site index base age	Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
CgF:				
Cedarcreek, outslope	black locust		100	---
	eastern white pine	50	94	174
	northern red oak	50	80	62
	yellow-poplar	50	105	115
Cedarcreek, bench	black locust		100	---
	eastern white pine	50	94	174
	northern red oak	50	80	62
	yellow-poplar	50	105	115
ChA:				
Chavies, rarely flooded	yellow-poplar	50	99	105
	northern red oak	50	85	67
	red maple	---	---	---
	sugar maple	---	---	---
	hickory	---	---	---
	black walnut	---	---	---
	American sycamore	---	---	---
	black cherry	---	---	---
	white oak	---	---	---
ClE:				
Clifftop	yellow-poplar	50	86	82
	northern red oak	50	75	57
	white oak	50	67	49
	American beech	50	---	---
	hickory	50	---	---
CnB:				
Clifftop	northern red oak	50	75	57
	yellow-poplar	50	86	82
	white oak	50	67	49
	American beech	50	---	---
	hickory	50	---	---
Nallen	chestnut oak	50	67	49
	hickory	---	---	---
	northern red oak	50	70	52
	red maple	---	---	---
	scarlet oak	50	56	39
	white oak	---	---	---
CnC:				
Clifftop	northern red oak	50	75	57
	yellow-poplar	50	86	82
	white oak	50	67	49
	American beech	50	---	---
	hickory	50	---	---
Nallen	chestnut oak	50	67	49
	hickory	---	---	---
	northern red oak	50	70	52
	red maple	---	---	---
	scarlet oak	50	56	39
	white oak	---	---	---

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Potential productivity: Characteristic trees	Potential productivity: Site index base age	Potential productivity: Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
CnD:				
Clifftop	hickory	50	---	---
	northern red oak	50	75	57
	white oak	50	67	49
	yellow-poplar	50	86	82
	American beech	50	---	---
Nallen	chestnut oak	50	67	49
	hickory	---	---	---
	northern red oak	50	70	52
	red maple	---	---	---
	scarlet oak	50	56	39
	white oak	---	---	---
CoA:				
Combs, occasionally flooded	northern red oak	50	90	71
	white oak	---	---	---
	American sycamore	---	---	---
	yellow-poplar	50	115	132
	black walnut	---	---	---
CpA:				
Combs, occasionally flooded	northern red oak	50	90	71
	white oak	---	---	---
	American sycamore	---	---	---
	yellow-poplar	50	115	132
	black walnut	---	---	---
Potomac, occasionally flooded	yellow-poplar	50	83	77
	northern red oak	50	70	52
	white oak	50	70	52
	river birch	---	---	---
	American sycamore	---	---	---
CrB:				
Cookport	northern red oak	50	76	58
	black cherry	50	86	54
	yellow-poplar	50	90	90
	white oak	---	---	---
Nallen	chestnut oak	50	67	49
	hickory	---	---	---
	northern red oak	50	70	52
	red maple	---	---	---
	scarlet oak	50	56	39
	white oak	---	---	---
CtB:				
Cotaco	white oak	---	---	---
	yellow-poplar	50	95	98
	northern red oak	50	87	68
	American beech	---	---	---

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Potential productivity: Characteristic trees	Site index base age	Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
CxA:				
Craigsville, rarely flooded	eastern white pine	50	90	166
	northern red oak	50	75	57
	Virginia pine	50	80	114
	yellow-poplar	50	90	100
DkC:				
Dekalb	scarlet oak	50	69	51
	northern red oak	50	65	47
	chestnut oak	50	60	43
	red maple	---	---	---
DrE:				
Dekalb	scarlet oak	50	69	51
	northern red oak	50	65	47
	chestnut oak	50	60	43
	red maple	---	---	---
GaB:				
Gilpin	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	74	56
	American beech	---	---	---
	hickory	---	---	---
GaC:				
Gilpin	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	74	56
	American beech	---	---	---
	hickory	---	---	---
GaD:				
Gilpin	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	74	56
	American beech	---	---	---
	hickory	---	---	---
GbE:				
Gilpin	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	74	56
	American beech	---	---	---
	hickory	---	---	---
Berks	black oak	50	70	52
	chestnut oak	50	70	52
	eastern white pine	50	82	148
	northern red oak	50	70	52
	Virginia pine	---	---	---
GhG:				
Gilpin	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	74	56
	American beech	---	---	---
	hickory	---	---	---

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Characteristic trees	Potential productivity: Site index base age	Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
GhG:				
Highsplint	black cherry	---	---	---
	yellow-poplar	50	108	121
	northern red oak	50	86	68
	sugar maple	---	---	---
	white oak	---	---	---
Berks	black oak	50	70	52
	chestnut oak	50	70	52
	eastern white pine	50	82	148
	northern red oak	50	70	52
	Virginia pine	---	---	---
HgE:				
Highsplint	black cherry	---	---	---
	yellow-poplar	50	108	121
	northern red oak	50	86	68
	sugar maple	---	---	---
	white oak	---	---	---
ImC:				
Itmann	eastern white pine	---	---	---
	red maple	---	---	---
	sweet birch	---	---	---
ImF:				
Itmann	eastern white pine	---	---	---
	red maple	---	---	---
	sweet birch	---	---	---
KmC:				
Kaymine, bench	northern red oak	50	80	62
	yellow-poplar	50	105	115
	eastern white pine	50	94	174
	black locust	---	---	---
KrF:				
Kaymine, outslope	northern red oak	50	80	62
	yellow-poplar	50	105	115
	eastern white pine	50	94	174
	black locust	---	---	---
Kaymine, bench	northern red oak	50	80	62
	yellow-poplar	50	105	115
	eastern white pine	50	94	174
	black locust	---	---	---
KwA:				
Knowlton, rarely flooded	pin oak	50	80	62
	boxelder	---	---	---
	red maple	---	---	---
	American sycamore	---	---	---
LaC:				
Laidig	eastern hemlock	50	---	---
	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	80	62

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Characteristic trees	Site index base age	Site index	Volume of wood fiber (CMAI)
		Potential productivity		
		yrs	ft	cu ft/ac/yr
LeF:				
Layland	yellow-poplar	50	100	107
	northern red oak	50	82	64
	white oak	50	---	---
	American beech	---	---	---
	eastern hemlock	---	---	---
Dekalb	scarlet oak	50	69	51
	northern red oak	50	65	47
	chestnut oak	50	60	43
	red maple	---	---	---
Guyandotte	American basswood	50	99	61
	black cherry	50	86	53
	black locust	50	85	---
	northern red oak	50	92	74
	yellow-poplar	50	110	124
LgG:				
Layland	yellow-poplar	50	100	107
	northern red oak	50	82	64
	white oak	50	---	---
	American beech	---	---	---
	eastern hemlock	---	---	---
Dekalb	scarlet oak	50	69	51
	northern red oak	50	65	47
	chestnut oak	50	60	43
	red maple	---	---	---
LhE:				
Layland	yellow-poplar	50	100	107
	northern red oak	50	82	64
	white oak	50	---	---
	American beech	---	---	---
	eastern hemlock	---	---	---
Laidig	eastern hemlock	50	---	---
	yellow-poplar	50	90	90
	northern red oak	50	80	62
	white oak	50	80	62
LlB:				
Lily	chestnut oak	50	71	53
	hickory	---	---	---
	northern red oak	50	75	57
	scarlet oak	50	64	47
	white oak	---	---	---
LlC:				
Lily	chestnut oak	50	71	53
	hickory	---	---	---
	northern red oak	50	75	57
	scarlet oak	50	64	47
	white oak	---	---	---

Table 10.—Forest Productivity—Continued

Map unit symbol and soil name	Characteristic trees	Site index base age	Site index	Volume of wood fiber (CMAI)
		yrs	ft	cu ft/ac/yr
NfC:				
Nallen	northern red oak	50	70	52
	chestnut oak	50	67	49
	scarlet oak	50	56	39
	red maple	---	---	---
	hickory	---	---	---
	white oak	---	---	---
Fenwick	black cherry	50	85	52
	northern red oak	50	75	57
	sugar maple	50	80	50
	white ash	50	85	111
	yellow-poplar	50	90	90
PhA:				
Philo, occasionally flooded	American sycamore	35	83	84
	northern red oak	50	84	65
	white oak	50	83	64
	yellow-poplar	50	100	107
Pope, occasionally flooded	yellow-poplar	50	96	100
	northern red oak	50	80	62
	white oak	50	80	62
	bitternut hickory	---	---	---
	American beech	---	---	---
	blackgum	---	---	---
	American sycamore	---	---	---
	American basswood	---	---	---
	eastern hemlock	---	---	---
PkC:				
Pipestem	northern red oak	50	85	67
	yellow-poplar	50	107	119
	black cherry	---	---	---
	American beech	---	---	---
	sugar maple	---	---	---
PmE:				
Pipestem	northern red oak	50	85	67
	yellow-poplar	50	107	119
	black cherry	---	---	---
	American beech	---	---	---
	sugar maple	---	---	---
PxA:				
Potomac, frequently flooded	yellow-poplar	50	83	77
	northern red oak	50	70	52
	white oak	50	70	52
	river birch	---	---	---
	American sycamore	---	---	---
Nelse, frequently flooded	American beech	---	---	---
	northern red oak	50	87	68
	silver maple	---	---	---
	yellow-poplar	50	96	100

Table 11.—Land Management, Part I (Planting)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Well suited		Well suited		Severe	
						Low strength	1.00
CaC:							
Cateache	75	Moderately suited		Moderately suited		Severe	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	1.00
				Stickiness; high plasticity index	0.50		
				Rock fragments	0.50		
CbD:							
Cateache	75	Moderately suited		Poorly suited		Severe	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	1.00
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
CbE:							
Cateache	75	Moderately suited		Unsuited		Severe	
		Stickiness; high plasticity index	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
CcG:							
Cateache	40	Moderately suited		Unsuited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Stickiness; high plasticity index	0.50	Rock fragments	0.50		
				Stickiness; high plasticity index	0.50		
Pipestem	40	Moderately suited		Unsuited		Severe	
		Stickiness; high plasticity index	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50		
		Slope	0.50	Stickiness; high plasticity index	0.50		
CfC:							
Cedarcreek, bench	75	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
				Slope	0.50		
CgF:							
Cedarcreek, outslope	40	Moderately suited		Unsuited		Moderate	
		Rock fragments	0.50	Slope	1.00	Low strength	0.50
		Slope	0.50	Rock fragments	0.75		
Cedarcreek, bench	35	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
				Slope	0.50		
Rock outcrop, highwall	15	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part I (Planting)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
ChA:							
Chavies, rarely flooded	75	Well suited		Well suited		Moderate	
						Low strength	0.50
ClE:							
Clifftop	70	Well suited		Unsuited		Severe	
				Slope	1.00	Low strength	1.00
CnB:							
Clifftop	55	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
Nallen	30	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
CnC:							
Clifftop	50	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
Nallen	35	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
CnD:							
Clifftop	55	Well suited		Poorly suited		Severe	
				Slope	0.75	Low strength	1.00
Nallen	25	Well suited		Poorly suited		Severe	
				Slope	0.75	Low strength	1.00
CoA:							
Combs, occasionally flooded	85	Well suited		Well suited		Moderate	
						Low strength	0.50
CpA:							
Combs, occasionally flooded	45	Well suited		Moderately suited		Moderate	
				Rock fragments	0.50	Low strength	0.50
Potomac, occasionally flooded	35	Moderately suited		Moderately suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.50	Low strength	0.50
CrB:							
Cookport	50	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
Nallen	35	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
CtB:							
Cotaco	75	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
CxA:							
Craigsville, rarely flooded	90	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50

Table 11.—Land Management, Part I (Planting)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
DkC:							
Dekalb	80	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
				Slope	0.50		
DrE:							
Dekalb	55	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75		
Rock outcrop	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin	80	Well suited		Moderately suited		Slight	
				Slope	0.50	Strength	0.10
GaC:							
Gilpin	70	Well suited		Moderately suited		Slight	
				Slope	0.50	Strength	0.10
GaD:							
Gilpin	70	Well suited		Poorly suited		Slight	
				Slope	0.75	Strength	0.10
GbE:							
Gilpin	60	Well suited		Unsuited		Slight	
				Slope	1.00	Strength	0.10
				Rock fragments	0.50		
Berks	20	Well suited		Unsuited		Slight	
				Slope	1.00	Strength	0.10
				Rock fragments	0.50		
GhG:							
Gilpin	45	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Rock fragments	0.50	Rock fragments	0.75		
Highsplint	25	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Rock fragments	0.50	Rock fragments	0.75		
Berks	20	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Rock fragments	0.50	Rock fragments	0.75		
HgE:							
Highsplint	70	Well suited		Poorly suited		Slight	
				Slope	0.75	Strength	0.10
				Rock fragments	0.50		
ImC:							
Itmann	100	Moderately suited		Poorly suited		Slight	
		Rock fragments	0.50	Rock fragments	0.75	Strength	0.10
				Slope	0.50		
ImF:							
Itmann	100	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Sandiness	0.50	Rock fragments	0.75		
		Rock fragments	0.50	Sandiness	0.50		

Table 11.—Land Management, Part I (Planting)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
KmC:							
Kaymine, bench	70	Moderately suited		Moderately suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.50	Low strength	0.50
				Slope	0.50		
KrF:							
Kaymine, outslope	35	Moderately suited		Unsuited		Slight	
		Sandiness	0.50	Slope	1.00	Strength	0.10
		Slope	0.50	Rock fragments	0.50		
		Rock fragments	0.50	Sandiness	0.50		
Kaymine, bench	35	Moderately suited		Moderately suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.50	Low strength	0.50
				Slope	0.50		
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
KwA:							
Knowlton, rarely flooded	70	Well suited		Well suited		Severe	
						Low strength	1.00
LaC:							
Laidig	70	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
				Slope	0.50		
LeF:							
Layland	45	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
Dekalb	30	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
Guyandotte	15	Moderately suited		Unsuited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Rock fragments	0.50	Rock fragments	0.75		
LgG:							
Layland	45	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
Dekalb	30	Moderately suited		Unsuited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Rock fragments	0.50	Rock fragments	0.75		
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
				Slope	0.75		
Laidig	25	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
				Slope	0.75		

Table 11.—Land Management, Part I (Planting)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
LlB:							
Lily	70	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
LlC:							
Lily	70	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
LrA:							
Lithic Hapludolls, rarely flooded	80	Poorly suited		Unsuited		Moderate	
		Rock fragments	0.75	Rock fragments	1.00	Low strength	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Not rated		Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated		Not rated	
NfC:							
Nallen	65	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
				Rock fragments	0.50		
Fenwick	15	Well suited		Moderately suited		Severe	
				Slope	0.50	Low strength	1.00
				Rock fragments	0.50		
PhA:							
Philo, occasionally flooded	50	Well suited		Well suited		Severe	
						Low strength	1.00
Pope, occasionally flooded	30	Well suited		Well suited		Moderate	
						Low strength	0.50
PkC:							
Pipestem	85	Moderately suited		Moderately suited		Severe	
		Stickiness; high plasticity index	0.50	Rock fragments	0.50	Low strength	1.00
				Stickiness; high plasticity index	0.50		
				Slope	0.50		
PmE:							
Pipestem	80	Moderately suited		Poorly suited		Severe	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	1.00
		Rock fragments	0.50	Rock fragments	0.75		
				Stickiness; high plasticity index	0.50		
PxA:							
Potomac, frequently flooded	60	Moderately suited		Poorly suited		Moderate	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	0.50
Nelse, frequently flooded	20	Moderately suited		Poorly suited		Severe	
		Rock fragments	0.50	Rock fragments	0.75	Low strength	1.00

Table 11.—Land Management, Part I (Planting)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
Ur:							
Udorthents, railroad grade	93	Not rated		Not rated		Not rated	
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
						Low strength	0.50
CaC:							
Cateache	75	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Slope	1.00
						Low strength	0.50
						Landslides	0.08
CbD:							
Cateache	75	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.14
CbE:							
Cateache	75	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Low strength	0.50
CcG:							
Cateache	40	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Low strength	0.50
Pipestem	40	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Low strength	0.50
CfC:							
Cedarcreek, bench	75	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Landslides	0.03
CgF:							
Cedarcreek, outslope	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
Cedarcreek, bench	35	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Landslides	0.03
Rock outcrop, highwall	15	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
ChA:							
Chavies, rarely flooded	75	Slight		Slight		Well suited	
ClE:							
Clifftop	70	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Low strength	0.50
CnB:							
Clifftop	55	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Landslides	0.01
Nallen	30	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Slope	0.50
						Landslides	0.01
CnC:							
Clifftop	50	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.07
Nallen	35	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.07
CnD:							
Clifftop	55	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.15
Nallen	25	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.15
CoA:							
Combs, occasionally flooded	85	Slight		Slight		Poorly suited	
						Flooding	1.00
CpA:							
Combs, occasionally flooded	45	Slight		Slight		Poorly suited	
						Flooding	1.00
Potomac, occasionally flooded	35	Slight		Slight		Poorly suited	
						Flooding	1.00
CrB:							
Cookport	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Wetness	0.50
						Landslides	0.01

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
CrB:							
Nallen	35	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Slope	0.50
						Landslides	0.01
CtB:							
Cotaco	75	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Wetness	0.50
						Landslides	0.01
CxA:							
Craigsville, rarely flooded	90	Slight		Slight		Moderately suited	
						Rock fragments	0.50
DkC:							
Dekalb	80	Slight		Slight		Moderately suited	
						Slope	0.50
						Rock fragments	0.50
						Landslides	0.04
DrE:							
Dekalb	55	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Landslides	0.60
						Rock fragments	0.50
Rock outcrop	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin	80	Slight		Moderate		Well suited	
				Slope/erodibility	0.50	Landslides	0.01
GaC:							
Gilpin	70	Moderate		Severe		Moderately suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	0.50
						Landslides	0.06
GaD:							
Gilpin	70	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.15
GbE:							
Gilpin	60	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Berks	20	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
GhG:							
Gilpin	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
GhG:							
Highsplint	25	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
Berks	20	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
HgE:							
Highsplint	70	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Landslides	1.00
ImC:							
Itmann	100	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Landslides	0.03
ImF:							
Itmann	100	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Sandiness	0.50
KmC:							
Kaymine, bench	70	Slight		Slight		Moderately suited	
						Slope	0.50
						Landslides	0.03
KrF:							
Kaymine, outslope	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Sandiness	0.50
Kaymine, bench	35	Slight		Slight		Moderately suited	
						Slope	0.50
						Landslides	0.03
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
KwA:							
Knowlton, rarely flooded	70	Slight		Slight		Moderately suited	
						Low strength	0.50
LaC:							
Laidig	70	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Rock fragments	1.00
						Slope	0.50
						Low strength	0.50
						Landslides	0.12
LeF:							
Layland	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
LeF:							
Dekalb	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Rock fragments	0.50
Guyandotte	15	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
LgG:							
Layland	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
Dekalb	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	1.00
						Landslides	1.00
Laidig	25	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	1.00
						Landslides	1.00
						Low strength	0.50
LlB:							
Lily	70	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
						Landslides	0.01
LlC:							
Lily	70	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.05
LrA:							
Lithic Hapludolls, rarely flooded	80	Slight		Slight		Poorly suited	
						Rock fragments	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Not rated		Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NfC:							
Nallen	65	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.07
Fenwick	15	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Wetness	0.50
						Landslides	0.21
PhA:							
Philo, occasionally flooded	50	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
Pope, occasionally flooded	30	Slight		Slight		Poorly suited	
						Flooding	1.00
PkC:							
Pipestem	85	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.12
PmE:							
Pipestem	80	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.90
						Rock fragments	0.50
						Low strength	0.50
PxA:							
Potomac, frequently flooded	60	Slight		Slight		Poorly suited	
						Flooding	1.00
						Rock fragments	0.50
Nelse, frequently flooded	20	Slight		Slight		Poorly suited	
						Flooding	1.00
						Rock fragments	0.50
						Low strength	0.50
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part II (Hazard of Erosion and Suitability for Roads)—Continued

Map unit symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ur:							
Udorthents, railroad grade-----	93	Not rated		Not rated		Not rated	
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 11.—Land Management, Part III (Site Preparation)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
AtA:					
Atkins, frequently flooded	75	Well suited		Well suited	
CaC:					
Cateache	75	Well suited		Well suited	
CbD:					
Cateache	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
CbE:					
Cateache	75	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
CcG:					
Cateache	40	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
Pipestem	40	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
CfC:					
Cedarcreek, bench	75	Well suited		Poorly suited	
				Rock fragments	0.50
CgF:					
Cedarcreek, outslope	40	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
				Rock fragments	0.50
Cedarcreek, bench	35	Well suited		Poorly suited	
				Rock fragments	0.50
Rock outcrop, highwall	15	Not rated		Not rated	
ChA:					
Chavies, rarely flooded	75	Well suited		Well suited	
ClE:					
Clifftop	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
CnB:					
Clifftop	55	Well suited		Well suited	
Nallen	30	Poorly suited		Well suited	
		Restrictive layer	0.50		
CnC:					
Clifftop	50	Well suited		Well suited	
Nallen	35	Poorly suited		Well suited	
		Restrictive layer	0.50		

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
CnD:					
Clifftop------------	55	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Nallen--------------	25	Poorly suited		Poorly suited	
		Restrictive layer	0.50	Slope	0.50
		Slope	0.50		
CoA:					
Combs, occasionally flooded------------	85	Well suited		Well suited	
CpA:					
Combs, occasionally flooded------------	45	Well suited		Well suited	
Potomac, occasionally flooded------------	35	Well suited		Poorly suited	
				Rock fragments	0.50
CrB:					
Cookport------------	50	Well suited		Well suited	
Nallen--------------	35	Poorly suited		Well suited	
		Restrictive layer	0.50		
CtB:					
Cotaco--------------	75	Well suited		Well suited	
CxA:					
Craigsville, rarely flooded------------	90	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
DkC:					
Dekalb--------------	80	Poorly suited		Poorly suited	
		Restrictive layer	0.50	Rock fragments	0.50
		Rock fragments	0.50		
DrE:					
Dekalb--------------	55	Poorly suited		Poorly suited	
		Restrictive layer	0.50	Slope	0.50
		Slope	0.50	Rock fragments	0.50
		Rock fragments	0.50		
Rock outcrop--------	15	Not rated		Not rated	
GaB:					
Gilpin--------------	80	Well suited		Well suited	
GaC:					
Gilpin--------------	70	Well suited		Well suited	
GaD:					
Gilpin--------------	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
GbE:					
Gilpin	60	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Berks	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
GhG:					
Gilpin	45	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Highsplint	25	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Berks	20	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
		Restrictive layer	0.50		
HgE:					
Highsplint	70	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
ImC:					
Itmann	100	Well suited		Poorly suited	
				Rock fragments	0.50
ImF:					
Itmann	100	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
				Rock fragments	0.50
KmC:					
Kaymine, bench	70	Well suited		Poorly suited	
				Rock fragments	0.50
KrF:					
Kaymine, outslope	35	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
				Rock fragments	0.50
Kaymine, bench	35	Well suited		Poorly suited	
				Rock fragments	0.50
Rock outcrop, highwall	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded	70	Unsuited		Well suited	
		Wetness	1.00		
LaC:					
Laidig	70	Unsuited		Poorly suited	
		Rock fragments	1.00	Rock fragments	1.00

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value
LeF:					
Layland	45	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Dekalb	30	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Restrictive layer	0.50	Rock fragments	0.50
		Rock fragments	0.50		
Guyandotte	15	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
LgG:					
Layland	45	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Dekalb	30	Unsuited		Poorly suited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
		Restrictive layer	0.50		
Rock outcrop	10	Not rated		Not rated	
LhE:					
Layland	60	Unsuited		Poorly suited	
		Rock fragments	1.00	Rock fragments	1.00
		Slope	0.50	Slope	0.50
Laidig	25	Unsuited		Poorly suited	
		Rock fragments	1.00	Rock fragments	1.00
		Slope	0.50	Slope	0.50
LlB:					
Lily	70	Poorly suited		Well suited	
		Restrictive layer	0.50		
LlC:					
Lily	70	Poorly suited		Well suited	
		Restrictive layer	0.50		
LrA:					
Lithic Hapludolls, rarely flooded	80	Unsuited		Poorly suited	
		Restrictive layer	1.00	Rock fragments	1.00
		Rock fragments	1.00		
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Poorly suited		Well suited	
		Restrictive layer	0.50		
Fenwick	15	Well suited		Well suited	

Table 11.—Land Management, Part III (Site Preparation)—Continued

Map unit symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (deep)		Suitability for mechanical site preparation (surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PhA:					
Philo, occasionally flooded------------	50	Well suited		Well suited	
Pope, occasionally flooded------------	30	Well suited		Well suited	
PkC:					
Pipestem------------	85	Well suited		Well suited	
PmE:					
Pipestem------------	80	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
PxA:					
Potomac, frequently flooded------------	60	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
Nelse, frequently flooded------------	20	Poorly suited		Poorly suited	
		Rock fragments	0.50	Rock fragments	0.50
Qs:					
Quarry, sandstone---	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded-	95	Not rated		Not rated	
UgC:					
Udorthents, graded--	85	Not rated		Not rated	
UgF:					
Udorthents, graded--	85	Not rated		Not rated	
Ur:					
Udorthents, railroad grade-----	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water---------------	100	Not rated		Not rated	

Table 11.—Land Management, Part IV (Site Restoration)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
AtA:					
Atkins, frequently flooded	75	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
				Soil reaction	0.50
CaC:					
Cateache	75	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
CbD:					
Cateache	75	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
CbE:					
Cateache	75	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
CcG:					
Cateache	40	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
Pipestem	40	Low		Moderate	
				Available water	0.50
CfC:					
Cedarcreek, bench	75	High		Low	
		Texture/surface depth/rock fragments	1.00		
CgF:					
Cedarcreek, outslope	40	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
Cedarcreek, bench	35	High		Low	
		Texture/surface depth/rock fragments	1.00		
Rock outcrop, highwall	15	Not rated		Not rated	

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
ChA:					
Chavies, rarely flooded	75	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
ClE:					
Clifftop	70	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
CnB:					
Clifftop	55	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Nallen	30	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
CnC:					
Clifftop	50	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Nallen	35	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
CnD:					
Clifftop	55	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
Nallen	25	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
				Available water	0.50
CoA:					
Combs, occasionally flooded	85	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
CpA:					
Combs, occasionally flooded	45	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Potomac, occasionally flooded	35	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CrB:					
Cookport	50	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
				Soil reaction	0.50
Nallen	35	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
CtB:					
Cotaco	75	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
CxA:					
Craigsville, rarely flooded	90	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
				Soil reaction	0.50
DkC:					
Dekalb	80	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
DrE:					
Dekalb	55	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
				Available water	0.50
Rock outcrop	15	Not rated		Not rated	
GaB:					
Gilpin	80	Low		Low	
		Texture/rock fragments	0.10		
GaC:					
Gilpin	70	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
GaD:					
Gilpin	70	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
GbE:					
Gilpin	60	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
GbE:					
Berks	20	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
GhG:					
Gilpin	45	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
Highsplint	25	Low		Moderate	
				Available water	0.50
Berks	20	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
HgE:					
Highsplint	70	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
ImC:					
Itmann	100	High		Low	
		Texture/surface depth/rock fragments	1.00		
ImF:					
Itmann	100	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
KmC:					
Kaymine, bench	70	High		Low	
		Texture/rock fragments	1.00		
KrF:					
Kaymine, outslope	35	High		Moderate	
		Texture/rock fragments	1.00	Available water	0.50
Kaymine, bench	35	High		Low	
		Texture/rock fragments	1.00		
Rock outcrop, highwall	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded	70	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
				Soil reaction	0.50

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
LaC:					
Laidig	70	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
LeF:					
Layland	45	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
				Soil reaction	0.50
Dekalb	30	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
				Soil reaction	0.50
Guyandotte	15	Low		Low	
		Texture/rock fragments	0.10		
LgG:					
Layland	45	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
				Soil reaction	0.50
Dekalb	30	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
				Soil reaction	0.50
Rock outcrop	10	Not rated		Not rated	
LhE:					
Layland	60	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
				Available water	0.50
Laidig	25	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
				Available water	0.50
LlB:					
Lily	70	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
LlC:					
Lily	70	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
LrA:					
Lithic Hapludolls, rarely flooded	80	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Soil reaction	0.50
Fenwick	15	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
				Soil reaction	0.50
PhA:					
Philo, occasionally flooded	50	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Pope, occasionally flooded	30	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
				Soil reaction	0.50
PkC:					
Pipestem	85	Low		Low	
PmE:					
Pipestem	80	Low		Moderate	
				Available water	0.50
PxA:					
Potomac, frequently flooded	60	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Nelse, frequently flooded	20	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Qs:					
Quarry, sandstone	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded	95	Not rated		Not rated	

Table 11.—Land Management, Part IV (Site Restoration)—Continued

Map unit symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
UgC:					
Udorthents, graded	85	Not rated		Not rated	
UgF:					
Udorthents, graded	85	Not rated		Not rated	
Ur:					
Udorthents, railroad grade	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 12.—Recreation, Part I (Camp and Picnic Areas)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
AtA:					
Atkins, frequently flooded	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	1.00
		Slow water movement	1.00	Flooding	0.40
CaC:					
Cateache	75	Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84
		Slow water movement	0.50	Slow water movement	0.50
CbD:					
Cateache	75	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Slow water movement	0.50	Slow water movement	0.50
		Large stones content	0.47	Large stones content	0.47
CbE:					
Cateache	75	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Slow water movement	0.50	Slow water movement	0.50
		Large stones content	0.47	Large stones content	0.47
CcG:					
Cateache	40	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Slow water movement	0.50	Slow water movement	0.50
		Large stones content	0.47	Large stones content	0.47
		Gravel	0.24	Gravel	0.24
Pipestem	40	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47
CfC:					
Cedarcreek, bench	75	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
CgF:					
Cedarcreek, outslope	40	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
CgF:					
Cedarcreek, bench	35	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Rock outcrop, highwall	15	Not rated		Not rated	
ChA:					
Chavies, rarely flooded	75	Very limited		Not limited	
		Flooding	1.00		
ClE:					
Clifftop	70	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
CnB:					
Clifftop	55	Not limited		Not limited	
Nallen	30	Not limited		Not limited	
CnC:					
Clifftop	50	Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63
Nallen	35	Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63
CnD:					
Clifftop	55	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
Nallen	25	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
CoA:					
Combs, occasionally flooded	85	Very limited		Not limited	
		Flooding	1.00		
CpA:					
Combs, occasionally flooded	45	Very limited		Somewhat limited	
		Flooding	1.00	Large stones content	0.47
		Large stones content	0.47		
Potomac, occasionally flooded	35	Very limited		Somewhat limited	
		Flooding	1.00	Large stones content	0.47
		Large stones content	0.47		
CrB:					
Cookport	50	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.83
Nallen	35	Not limited		Not limited	

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
CtB:					
Cotaco	75	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19
CxA:					
Craigsville, rarely flooded	90	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00		
DkC:					
Dekalb	80	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.04	Slope	0.04
DrE:					
Dekalb	55	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Rock outcrop	15	Not rated		Not rated	
GaB:					
Gilpin	80	Not limited		Not limited	
GaC:					
Gilpin	70	Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37
GaD:					
Gilpin	70	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
GbE:					
Gilpin	60	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47
Berks	20	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47
GhG:					
Gilpin	45	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Highsplint	25	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value
GhG:					
Berks	20	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.81	Gravel	0.81
HgE:					
Highsplint	70	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47
ImC:					
Itmann	100	Not limited		Not limited	
ImF:					
Itmann	100	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
KmC:					
Kaymine, bench	70	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
KrF:					
Kaymine, outslope	35	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones content	0.47	Large stones content	0.47
Kaymine, bench	35	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Rock outcrop, highwall	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00		
LaC:					
Laidig	70	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.04	Slope	0.04
LeF:					
Layland	45	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Dekalb	30	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
LeF:					
Guyandotte	15	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
LgG:					
Layland	45	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Dekalb	30	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.34	Gravel	0.34
Rock outcrop	10	Not rated		Not rated	
LhE:					
Layland	60	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Laidig	25	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
LlB:					
Lily	70	Not limited		Not limited	
LlC:					
Lily	70	Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16
LrA:					
Lithic Hapludolls, rarely flooded	80	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Gravel	0.02
		Gravel	0.02		
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63
		Large stones content	0.47	Large stones content	0.47

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value
NfC:					
Fenwick	15	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	0.68
		Slope	0.63	Slope	0.63
		Large stones content	0.47	Large stones content	0.47
		Slow water movement	0.26	Slow water movement	0.26
PhA:					
Philo, occasionally flooded	50	Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.03
		Depth to saturated zone	0.07		
Pope, occasionally flooded	30	Very limited		Not limited	
		Flooding	1.00		
PkC:					
Pipestem	85	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
		Slope	0.04	Slope	0.04
PmE:					
Pipestem	80	Very limited		Very limited	
		Too steep	1.00	Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
PxA:					
Potomac, frequently flooded	60	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00	Flooding	0.40
Nelse, frequently flooded	20	Very limited		Very limited	
		Flooding	1.00	Large stones content	1.00
		Large stones content	1.00	Flooding	0.40
Qs:					
Quarry, sandstone	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded	95	Not rated		Not rated	
UgC:					
Udorthents, graded	85	Not rated		Not rated	
UgF:					
Udorthents, graded	85	Not rated		Not rated	

Table 12.—Recreation, Part I (Camp and Picnic Areas)—Continued

Map unit symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ur:					
Udorthents, railroad grade-----	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water---------------	100	Not rated		Not rated	

Table 12.—Recreation, Part II (Trail Management)

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AtA:					
Atkins, frequently flooded	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40
CaC:					
Cateache	75	Not limited		Not limited	
CbD:					
Cateache	75	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
		Slope	0.32		
CbE:					
Cateache	75	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.47
		Large stones content	0.47	Slope	0.22
CcG:					
Cateache	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47
Pipestem	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47
CfC:					
Cedarcreek, bench	75	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
CgF:					
Cedarcreek, outslope	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47
Cedarcreek, bench	35	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Rock outcrop, highwall	15	Not rated		Not rated	
ChA:					
Chavies, rarely flooded	75	Not limited		Not limited	

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
ClE:					
Clifftop	70	Very limited		Somewhat limited	
		Slope	1.00	Slope	0.22
CnB:					
Clifftop	55	Not limited		Not limited	
Nallen	30	Not limited		Not limited	
CnC:					
Clifftop	50	Not limited		Not limited	
Nallen	35	Not limited		Not limited	
CnD:					
Clifftop	55	Somewhat limited		Not limited	
		Slope	0.50		
Nallen	25	Somewhat limited		Not limited	
		Slope	0.50		
CoA:					
Combs, occasionally flooded	85	Not limited		Not limited	
CpA:					
Combs, occasionally flooded	45	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Potomac, occasionally flooded	35	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
CrB:					
Cookport	50	Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.62	Depth to saturated zone	0.62
Nallen	35	Not limited		Not limited	
CtB:					
Cotaco	75	Not limited		Not limited	
CxA:					
Craigsville, rarely flooded	90	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
DkC:					
Dekalb	80	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
DrE:					
Dekalb	55	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
Rock outcrop	15	Not rated		Not rated	
GaB:					
Gilpin	80	Not limited		Not limited	
GaC:					
Gilpin	70	Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00
GaD:					
Gilpin	70	Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00
		Slope	0.50		
GbE:					
Gilpin	60	Very limited		Very limited	
		Slope	1.00	Water erosion	1.00
		Water erosion	1.00	Large stones content	0.47
		Large stones content	0.47	Slope	0.22
Berks	20	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.47
		Large stones content	0.47	Slope	0.22
GhG:					
Gilpin	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Water erosion	1.00
		Water erosion	1.00	Slope	1.00
Highsplint	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Berks	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
HgE:					
Highsplint	70	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.47
		Large stones content	0.47		
ImC:					
Itmann	100	Not limited		Not limited	
ImF:					
Itmann	100	Very limited		Very limited	
		Slope	1.00	Slope	1.00

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
KmC:					
Kaymine, bench	70	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
KrF:					
Kaymine, outslope	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47
Kaymine, bench	35	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Rock outcrop, highwall	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
LaC:					
Laidig	70	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
LeF:					
Layland	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Dekalb	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Guyandotte	15	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
LgG:					
Layland	45	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Dekalb	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Rock outcrop	10	Not rated		Not rated	

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
LhE:					
Layland	60	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
Laidig	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00		
LlB:					
Lily	70	Not limited		Not limited	
LlC:					
Lily	70	Not limited		Not limited	
LrA:					
Lithic Hapludolls, rarely flooded	80	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
Fenwick	15	Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00
		Large stones content	0.47	Large stones content	0.47
		Depth to saturated zone	0.32	Depth to saturated zone	0.32
PhA:					
Philo, occasionally flooded	50	Not limited		Not limited	
Pope, occasionally flooded	30	Not limited		Not limited	
PkC:					
Pipestem	85	Somewhat limited		Somewhat limited	
		Large stones content	0.47	Large stones content	0.47
PmE:					
Pipestem	80	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	0.92		

Table 12.—Recreation, Part II (Trail Management)—Continued

Map unit symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails: Rating class and limiting features	Value	Mountain bike and off-road vehicle trails: Rating class and limiting features	Value
PxA:					
Potomac, frequently flooded	60	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Flooding	0.40	Flooding	0.40
Nelse, frequently flooded	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Flooding	0.40	Flooding	0.40
Qs:					
Quarry, sandstone	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded	95	Not rated		Not rated	
UgC:					
Udorthents, graded	85	Not rated		Not rated	
UgF:					
Udorthents, graded	85	Not rated		Not rated	
Ur:					
Udorthents, railroad grade	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 13.—Dwellings and Small Commercial Buildings

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CaC:							
Cateache	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
				Depth to soft bedrock	0.05		
CbD:							
Cateache	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.05		
CbE:							
Cateache	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.05		
CcG:							
Cateache	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
Pipestem	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
CfC:							
Cedarcreek, bench	75	Not limited		Not limited		Very limited	
						Slope	1.00
CgF:							
Cedarcreek, outslope	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
Cedarcreek, bench	35	Not limited		Not limited		Very limited	
						Slope	1.00
Rock outcrop, highwall	15	Not rated		Not rated		Not rated	
ChA:							
Chavies, rarely flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ClE:							
Clifftop	70	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
CnB:							
Clifftop	55	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.06	Slope	0.28
Nallen	30	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.15	Depth to hard bedrock	1.00	Slope	0.50
						Depth to hard bedrock	0.15
CnC:							
Clifftop	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.06		
Nallen	35	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.15	Slope	0.63	Depth to hard bedrock	0.15
CnD:							
Clifftop	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
Nallen	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.15	Depth to hard bedrock	1.00	Depth to hard bedrock	0.15
CoA:							
Combs, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.35		
CpA:							
Combs, occasionally flooded	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.35		
Potomac, occasionally flooded	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
CrB:							
Cookport	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to thin cemented pan	0.50	Depth to hard bedrock	0.54	Slope	0.28

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
CrB:							
Nallen	35	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.15	Depth to hard bedrock	1.00	Slope	0.50
						Depth to hard bedrock	0.15
CtB:							
Cotaco	75	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
						Slope	0.28
CxA:							
Craigsville, rarely flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.35		
DkC:							
Dekalb	80	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.32	Depth to hard bedrock	1.00	Slope	1.00
		Large stones	0.14	Large stones	0.14	Depth to hard bedrock	0.32
		Slope	0.04	Slope	0.04	Large stones	0.14
DrE:							
Dekalb	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.32	Depth to hard bedrock	1.00	Depth to hard bedrock	0.32
		Large stones	0.14	Large stones	0.14	Large stones	0.14
Rock outcrop	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin	80	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.46	Slope	0.28
GaC:							
Gilpin	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Depth to soft bedrock	0.46	Slope	1.00
				Slope	0.37		
GaD:							
Gilpin	70	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
GbE:							
Gilpin	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.46		
Berks	20	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.03	Depth to hard bedrock	1.00	Depth to hard bedrock	0.03

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GhG:							
Gilpin	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
				Depth to soft bedrock	0.79		
Highsplint	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
Berks	20	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.15	Depth to hard bedrock	1.00	Depth to hard bedrock	0.15
HgE:							
Highsplint	70	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
ImC:							
Itmann	100	Not limited		Not limited		Very limited	
						Slope	1.00
ImF:							
Itmann	100	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
KmC:							
Kaymine, bench	70	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.04	Large stones	0.04	Slope	1.00
						Large stones	0.04
KrF:							
Kaymine, outslope	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	0.32	Large stones	0.32	Large stones	0.32
Kaymine, bench	35	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.04	Large stones	0.04	Slope	1.00
						Large stones	0.04
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
KwA:							
Knowlton, rarely flooded	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
LaC:							
Laidig	70	Somewhat limited		Very limited		Very limited	
		Depth to thin cemented pan	0.50	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.04	Slope	0.04		
LeF:							
Layland	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LeF:							
Dekalb	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.32	Depth to hard bedrock	1.00	Depth to hard bedrock	0.32
		Large stones	0.14	Large stones	0.14	Large stones	0.14
Guyandotte	15	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
LgG:							
Layland	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
Dekalb	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Depth to hard bedrock	0.42
		Large stones	0.14	Large stones	0.14	Large stones	0.14
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
Laidig	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to thin cemented pan	0.50	Depth to saturated zone	1.00		
LlB:							
Lily	70	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.08	Depth to hard bedrock	1.00	Slope	0.28
						Depth to hard bedrock	0.08
LlC:							
Lily	70	Somewhat limited		Very limited		Very limited	
		Slope	0.16	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.08	Slope	0.16	Depth to hard bedrock	0.08
LrA:							
Lithic Hapludolls, rarely flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Not rated		Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated		Not rated	

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
NfC:							
Nallen	65	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.15	Slope	0.63	Depth to hard bedrock	0.15
Fenwick	15	Somewhat limited		Very limited		Very limited	
		Depth to saturated zone	0.95	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Depth to hard bedrock	1.00	Depth to saturated zone	0.95
				Slope	0.63		
PhA:							
Philo, occasionally flooded	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
Pope, occasionally flooded	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
PkC:							
Pipestem	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
PmE:							
Pipestem	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
PxA:							
Potomac, frequently flooded	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Nelse, frequently flooded	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.15		
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
Ur:							
Udorthents, railroad grade	93	Not rated		Not rated		Not rated	

Table 13.—Dwellings and Small Commercial Buildings—Continued

Map unit symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water----------------	100	Not rated		Not rated		Not rated	

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Landscaping: Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
CaC:							
Cateache	75	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.84	Slope	0.84
		Slope	0.84	Unstable excavation walls	0.10	Depth to bedrock	0.05
		Frost action	0.50	Depth to soft bedrock	0.05		
CbD:							
Cateache	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50	Depth to soft bedrock	0.05	Depth to bedrock	0.05
CbE:							
Cateache	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50	Depth to soft bedrock	0.05	Depth to bedrock	0.05
CcG:							
Cateache	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Gravel	0.24
		Frost action	0.50	Depth to soft bedrock	0.06	Depth to bedrock	0.06
Pipestem	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50				
CfC:							
Cedarcreek, bench	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.96
						Large stones	0.20

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Landscaping: Rating class and limiting features	Value
CgF:							
Cedarcreek, outslope	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.96
						Large stones	0.20
Cedarcreek, bench	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.96
						Large stones	0.20
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
ChA:							
Chavies, rarely flooded	75	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Unstable excavation walls	0.10		
		Flooding	0.40				
ClE:							
Clifftop	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Depth to bedrock	0.10
				Unstable excavation walls	0.10		
CnB:							
Clifftop	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
Nallen	30	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Depth to hard bedrock	1.00	Depth to bedrock	0.16
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10		
CnC:							
Clifftop	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
Nallen	35	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Depth to hard bedrock	1.00	Slope	0.63
		Frost action	0.50	Slope	0.63	Depth to bedrock	0.16
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10		
CnD:							
Clifftop	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CnD:							
Nallen	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.16
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10		
CoA:							
Combs, occasionally flooded	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.35		
				Unstable excavation walls	0.10		
CpA:							
Combs, occasionally flooded	45	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.35		
				Unstable excavation walls	0.10		
Potomac, occasionally flooded	35	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Unstable excavation walls	1.00	Droughty	0.95
				Flooding	0.60	Flooding	0.60
						Large stones	0.20
CrB:							
Cookport	50	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
		Frost action	0.50	Depth to hard bedrock	0.54		
				Unstable excavation walls	0.10		
Nallen	35	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Depth to hard bedrock	1.00	Depth to bedrock	0.16
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10		
CtB:							
Cotaco	75	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.28
		Frost action	0.50	Unstable excavation walls	0.10		
		Depth to saturated zone	0.28				
CxA:							
Craigsville, rarely flooded	90	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Unstable excavation walls	1.00	Large stones	1.00
		Flooding	0.40	Depth to saturated zone	0.35	Droughty	0.28

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Landscaping: Rating class and limiting features	Value
DkC:							
Dekalb	80	Somewhat limited Frost action Depth to hard bedrock Large stones Slope	 0.50 0.32 0.14 0.04	Very limited Depth to hard bedrock Large stones Unstable excavation walls Slope	 1.00 0.14 0.10 0.04	Very limited Large stones Depth to bedrock Droughty Slope	 1.00 0.32 0.32 0.04
DrE:							
Dekalb	55	Very limited Slope Frost action Depth to hard bedrock Large stones	 1.00 0.50 0.32 0.14	Very limited Depth to hard bedrock Slope Large stones Unstable excavation walls	 1.00 1.00 0.14 0.10	Very limited Slope Large stones Depth to bedrock Droughty	 1.00 1.00 0.32 0.32
Rock outcrop	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin	80	Somewhat limited Frost action Low strength	 0.50 0.22	Somewhat limited Depth to soft bedrock Unstable excavation walls	 0.46 0.10	Somewhat limited Depth to bedrock	 0.46
GaC:							
Gilpin	70	Somewhat limited Frost action Slope Low strength	 0.50 0.37 0.32	Somewhat limited Depth to soft bedrock Slope Unstable excavation walls	 0.46 0.37 0.10	Somewhat limited Depth to bedrock Slope	 0.46 0.37
GaD:							
Gilpin	70	Very limited Slope Frost action Low strength	 1.00 0.50 0.22	Very limited Slope Depth to soft bedrock Unstable excavation walls	 1.00 0.46 0.10	Very limited Slope Depth to bedrock	 1.00 0.46
GbE:							
Gilpin	60	Very limited Slope Frost action Low strength	 1.00 0.50 0.22	Very limited Slope Depth to soft bedrock Unstable excavation walls	 1.00 0.46 0.10	Very limited Slope Depth to bedrock Large stones	 1.00 0.46 0.20
Berks	20	Very limited Slope Frost action Depth to hard bedrock	 1.00 0.50 0.03	Very limited Depth to hard bedrock Slope Unstable excavation walls	 1.00 1.00 0.10	Very limited Slope Droughty Large stones Depth to bedrock	 1.00 0.68 0.20 0.03

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GhG:							
Gilpin	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.79	Depth to bedrock	0.80
		Low strength	0.22	Unstable excavation walls	0.10	Droughty	0.01
Highsplint	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	1.00
Berks	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Droughty	0.83
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10	Gravel	0.81
						Depth to bedrock	0.16
						Large stones	0.03
ImC:							
Itmann	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.11
ImF:							
Itmann	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.11
KmC:							
Kaymine, bench	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.20
		Large stones	0.04	Large stones	0.04		
KrF:							
Kaymine, outslope	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Large stones	0.32	Large stones	0.20
		Large stones	0.32	Unstable excavation walls	0.10		
Kaymine, bench	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.20
		Large stones	0.04	Large stones	0.04		
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
KwA:							
Knowlton, rarely flooded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Flooding	0.40				

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Landscaping: Rating class and limiting features	Value
LaC:							
Laidig	70	Somewhat limited		Very limited		Very limited	
		Frost action	0.50	Depth to saturated zone	1.00	Large stones	1.00
		Slope	0.04	Unstable excavation walls	1.00	Slope	0.04
				Slope	0.04		
LeF:							
Layland	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	1.00	Large stones	1.00
Dekalb	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Large stones	1.00
		Depth to hard bedrock	0.32	Large stones	0.14	Depth to bedrock	0.32
		Large stones	0.14	Unstable excavation walls	0.10	Droughty	0.32
Guyandotte	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	1.00	Large stones	1.00
LgG:							
Layland	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	1.00	Large stones	1.00
Dekalb	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Large stones	0.99
		Depth to hard bedrock	0.42	Large stones	0.14	Depth to bedrock	0.42
		Large stones	0.14	Unstable excavation walls	0.10	Droughty	0.35
						Gravel	0.34
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	1.00	Large stones	1.00
Laidig	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to saturated zone	1.00	Large stones	1.00
				Unstable excavation walls	1.00		
LlB:							
Lily	70	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Depth to hard bedrock	1.00	Depth to bedrock	0.08
		Depth to hard bedrock	0.08	Unstable excavation walls	0.10		

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Landscaping: Rating class and limiting features	Value
LlC:							
Lily	70	Somewhat limited Frost action Slope Depth to hard bedrock	 0.50 0.16 0.08	Very limited Depth to hard bedrock Slope Unstable excavation walls	 1.00 0.16 0.10	Somewhat limited Slope Depth to bedrock	 0.16 0.08
LrA:							
Lithic Hapludolls, rarely flooded	80	Very limited Depth to hard bedrock Frost action Flooding	 1.00 0.50 0.40	Very limited Depth to hard bedrock Unstable excavation walls	 1.00 0.10	Very limited Depth to bedrock Droughty Large stones Gravel	 1.00 1.00 0.84 0.02
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Not rated		Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated		Not rated	
NfC:							
Nallen	65	Somewhat limited Slope Frost action Depth to hard bedrock	 0.63 0.50 0.15	Very limited Depth to hard bedrock Slope Unstable excavation walls	 1.00 0.63 0.10	Somewhat limited Slope Large stones Depth to bedrock	 0.63 0.20 0.16
Fenwick	15	Somewhat limited Low strength Depth to saturated zone Slope Frost action	 0.78 0.68 0.63 0.50	Very limited Depth to hard bedrock Depth to saturated zone Slope Unstable excavation walls	 1.00 1.00 0.63 0.10	Somewhat limited Depth to saturated zone Slope Large stones	 0.68 0.63 0.20
PhA:							
Philo, occasionally flooded	50	Very limited Flooding Frost action Depth to saturated zone	 1.00 0.50 0.03	Very limited Depth to saturated zone Unstable excavation walls Flooding	 1.00 1.00 0.60	Somewhat limited Flooding Depth to saturated zone	 0.60 0.03
Pope, occasionally flooded	30	Very limited Flooding Frost action	 1.00 0.50	Very limited Unstable excavation walls Flooding	 1.00 0.60	Somewhat limited Flooding	 0.60
PkC:							
Pipestem	85	Very limited Low strength Frost action Slope	 1.00 0.50 0.04	Somewhat limited Unstable excavation walls Slope	 0.10 0.04	Somewhat limited Large stones Slope	 0.20 0.04

Table 14.—Roads and Streets, Shallow Excavations, and Landscaping—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PmE:							
Pipestem	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	1.00
		Frost action	0.50				
PxA:							
Potomac, frequently flooded	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	1.00
						Large stones	1.00
				Flooding	0.80	Droughty	0.95
Nelse, frequently flooded	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	1.00
						Large stones	0.11
				Flooding	0.80		
				Depth to saturated zone	0.15		
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
Ur:							
Udorthents, railroad grade	93	Not rated		Not rated		Not rated	
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 15.—Sewage Disposal

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AtA:					
Atkins, frequently flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.21
CaC:					
Cateache	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Slope	0.84	Seepage	0.50
CbD:					
Cateache	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Too steep	1.00	Seepage	0.50
CbE:					
Cateache	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Too steep	1.00	Seepage	0.50
CcG:					
Cateache	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Too steep	1.00	Seepage	0.50
Pipestem	40	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
CfC:					
Cedarcreek, bench	75	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
				Large stones	0.03
CgF:					
Cedarcreek, outslope	40	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.03

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CgF:					
Cedarcreek, bench	35	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
				Large stones	0.03
Rock outcrop, highwall	15	Not rated		Not rated	
ChA:					
Chavies, rarely flooded	75	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Flooding	0.40
		Flooding	0.40		
ClE:					
Clifftop	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00		
		Slow water movement	0.61	Slope	1.00
				Seepage	0.50
CnB:					
Clifftop	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.61		
				Slope	0.82
				Seepage	0.50
Nallen	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00		
				Seepage	1.00
				Slope	0.92
CnC:					
Clifftop	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63		
		Slow water movement	0.61	Slope	1.00
				Seepage	0.50
Nallen	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00		
				Slope	1.00
		Slope	0.63	Seepage	1.00
CnD:					
Clifftop	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00		
		Slow water movement	0.61	Slope	1.00
				Seepage	0.50
Nallen	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00		
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CoA:					
Combs, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to saturated zone	0.84	Depth to saturated zone	0.17
CpA:					
Combs, occasionally flooded	45	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to saturated zone	0.84	Depth to saturated zone	0.17
Potomac, occasionally flooded	35	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00		
CrB:					
Cookport	50	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.82
				Seepage	0.50
		Depth to bedrock	0.82	Depth to hard bedrock	0.54
Nallen	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.92
CtB:					
Cotaco	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Slope	0.82
				Seepage	0.50
CxA:					
Craigsville, rarely flooded	90	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Flooding	0.40
		Seepage, bottom layer	1.00	Depth to saturated zone	0.17
		Depth to saturated zone	0.84	Slope	0.02
		Flooding	0.40		

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
DkC:					
Dekalb	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Slope	1.00
		Large stones	0.14	Large stones	0.18
		Slope	0.04		
DrE:					
Dekalb	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Large stones	0.18
		Large stones	0.14		
Rock outcrop	15	Not rated		Not rated	
GaB:					
Gilpin	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.61	Slope	0.82
				Seepage	0.50
GaC:					
Gilpin	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.61	Slope	1.00
		Slope	0.37	Seepage	0.50
GaD:					
Gilpin	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00	Slope	1.00
		Slow water movement	0.61	Seepage	0.50
GbE:					
Gilpin	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00	Slope	1.00
		Slow water movement	0.61	Seepage	0.50
Berks	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
GhG:					
Gilpin	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Too steep	1.00	Slope	1.00
		Slow water movement	0.61	Seepage	0.50

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
GhG:					
Highsplint----------	25	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Berks---------------	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
HgE:					
Highsplint----------	70	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
ImC:					
Itmann--------------	100	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	1.00
		Seepage, bottom layer	1.00		
ImF:					
Itmann--------------	100	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Filtering capacity	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
KmC:					
Kaymine, bench------	70	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.04	Large stones	0.07
KrF:					
Kaymine, outslope---	35	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Large stones	1.00
				Seepage	1.00
		Large stones	0.32		
Kaymine, bench------	35	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.04	Large stones	0.07
Rock outcrop, highwall-----------	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded------------	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Seepage	1.00
				Flooding	0.40
		Flooding	0.40		

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LaC:					
Laidig	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Organic matter content	1.00
		Slope	0.04	Seepage	0.52
				Depth to saturated zone	0.10
LeF:					
Layland	45	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.98	Seepage	0.54
Dekalb	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Large stones	0.18
		Large stones	0.14		
Guyandotte	15	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
LgG:					
Layland	45	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.98	Seepage	0.54
Dekalb	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Filtering capacity	1.00	Large stones	0.14
		Large stones	0.14		
Rock outcrop	10	Not rated		Not rated	
LhE:					
Layland	60	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.98	Organic matter content	1.00
				Seepage	0.54
Laidig	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.52
		Too steep	1.00	Depth to saturated zone	0.10

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LlB:					
Lily	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.82
LlC:					
Lily	70	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.16	Seepage	1.00
LrA:					
Lithic Hapludolls, rarely flooded	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
Fenwick	15	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Slow water movement	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00
		Slope	0.63	Seepage	0.50
PhA:					
Philo, occasionally flooded	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50		
Pope, occasionally flooded	30	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 15.—Sewage Disposal—Continued

Map unit symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
PkC:					
Pipestem	85	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
		Slope	0.04		
PmE:					
Pipestem	80	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
PxA:					
Potomac, frequently flooded	60	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.02
		Filtering capacity	1.00		
Nelse, frequently flooded	20	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.02
		Seepage, bottom layer	1.00		
		Depth to saturated zone	0.40		
Qs:					
Quarry, sandstone	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded	95	Not rated		Not rated	
UgC:					
Udorthents, graded	85	Not rated		Not rated	
UgF:					
Udorthents, graded	85	Not rated		Not rated	
Ur:					
Udorthents, railroad grade	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 16.—Source of Gravel and Sand

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
AtA:					
Atkins, frequently flooded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CaC:					
Cateache	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CbD:					
Cateache	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CbE:					
Cateache	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CcG:					
Cateache	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pipestem	40	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
CfC:					
Cedarcreek, bench	75	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.18	Thickest layer	0.00
CgF:					
Cedarcreek, outslope	40	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.18	Thickest layer	0.00
Cedarcreek, bench	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.18	Thickest layer	0.00
Rock outcrop, highwall	10	Not rated		Not rated	
ChA:					
Chavies, rarely flooded	75	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03

Table 16.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Value	Sand source: Rating class and limiting features	Value
ClE:					
Clifftop------------	70	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
CnB:					
Clifftop------------	55	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.25	Thickest layer	0.00
Nallen--------------	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
CnC:					
Clifftop------------	50	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.25	Thickest layer	0.00
Nallen--------------	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
CnD:					
Clifftop------------	55	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.25	Thickest layer	0.00
Nallen--------------	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
CoA:					
Combs, occasionally flooded------------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
CpA:					
Combs, occasionally flooded------------	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Potomac, occasionally flooded------------	35	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.02
		Bottom layer	0.00	Bottom layer	0.10
CrB:					
Cookport------------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nallen--------------	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
CtB:					
Cotaco--------------	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 16.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source		Sand source	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CxA:					
Craigsville, rarely flooded	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.12
DkC:					
Dekalb	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DrE:					
Dekalb	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	15	Not rated		Not rated	
GaB:					
Gilpin	80	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
GaC:					
Gilpin	70	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
GaD:					
Gilpin	70	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
GbE:					
Gilpin	60	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Berks	20	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
GhG:					
Gilpin	45	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Highsplint	25	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Berks	20	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
HgE:					
Highsplint	70	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Table 16.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Value	Sand source: Rating class and limiting features	Value
ImC:					
Itmann	100	Fair		Fair	
		Thickest layer	0.06	Thickest layer	0.01
		Bottom layer	0.19	Bottom layer	0.02
ImF:					
Itmann	100	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.01
		Bottom layer	0.23	Bottom layer	0.02
KmC:					
Kaymine, bench	70	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
KrF:					
Kaymine, outslope	40	Fair		Poor	
		Bottom layer	0.08	Bottom layer	0.00
		Thickest layer	0.13	Thickest layer	0.00
Kaymine, bench	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Rock outcrop, highwall	10	Not rated		Not rated	
KwA:					
Knowlton, rarely flooded	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaC:					
Laidig	70	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
LeF:					
Layland	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dekalb	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Guyandotte	15	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.05	Thickest layer	0.00
LgG:					
Layland	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dekalb	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop	10	Not rated		Not rated	

Table 16.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
LhE:					
Layland	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Laidig	25	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
LlB:					
Lily	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
LlC:					
Lily	70	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
LrA:					
Lithic Hapludolls, rarely flooded	80	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.08	Thickest layer	0.00
Rock outcrop	20	Not rated		Not rated	
LxG:					
Lithic Udorthents, cut land	50	Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated	
NfC:					
Nallen	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
Fenwick	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PhA:					
Philo, occasionally flooded	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
Pope, occasionally flooded	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.03
		Thickest layer	0.00	Bottom layer	0.03
PkC:					
Pipestem	85	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
PmE:					
Pipestem	80	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Table 16.—Source of Gravel and Sand—Continued

Map unit symbol and soil name	Pct. of map unit	Gravel source: Rating class and limiting features	Gravel source: Value	Sand source: Rating class and limiting features	Sand source: Value
PxA:					
Potomac, frequently flooded	60	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.02
		Bottom layer	0.00	Bottom layer	0.10
Nelse, frequently flooded	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.31
Qs:					
Quarry, sandstone	100	Not rated		Not rated	
Rw:					
Riverwash, frequently flooded	95	Not rated		Not rated	
UgC:					
Udorthents, graded	85	Not rated		Not rated	
UgF:					
Udorthents, graded	85	Not rated		Not rated	
Ur:					
Udorthents, railroad graded	93	Not rated		Not rated	
Uu:					
Udorthents, highways	70	Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated	
W:					
Water	98	Not rated		Not rated	

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Fair		Poor		Poor	
		Too acid	0.50	Wetness depth	0.00	Wetness depth	0.00
						Too acid	0.88
CaC:							
Cateache	75	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.00
		Droughty	0.76	Low strength	0.00	Slope	0.16
		Too clayey	0.92			Too clayey	0.74
		Depth to bedrock	0.95			Too acid	0.92
						Depth to bedrock	0.95
CbD:							
Cateache	75	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.76	Low strength	0.00	Rock fragments	0.00
		Too clayey	0.92	Slope	0.68	Too clayey	0.74
		Depth to bedrock	0.95			Too acid	0.92
						Depth to bedrock	0.95
CbE:							
Cateache	75	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.79	Slope	0.00	Rock fragments	0.00
		Too clayey	0.92	Low strength	0.00	Too clayey	0.74
		Depth to bedrock	0.95			Too acid	0.92
						Depth to bedrock	0.95
CcG:							
Cateache	40	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.79	Slope	0.00	Rock fragments	0.00
		Too clayey	0.92	Low strength	0.00	Too clayey	0.74
		Depth to bedrock	0.93			Too acid	0.92
						Depth to bedrock	0.93
Pipestem	40	Fair		Poor		Poor	
		Stone content	0.14	Low strength	0.00	Slope	0.00
		Too clayey	0.50	Slope	0.00	Too clayey	0.41
		Too acid	0.61	Stones	0.68	Hard to reclaim (rock fragments)	0.50
						Rock fragments	0.84
CfC:							
Cedarcreek, bench	75	Fair		Fair		Poor	
		Organic matter content low	0.01	Cobble content	0.61	Rock fragments	0.00
		Droughty	0.07			Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Too acid	0.59

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
CgF:							
Cedarcreek, outslope	40	Fair		Poor		Poor	
		Organic matter content low	0.01	Slope	0.00	Rock fragments	0.00
		Droughty	0.07	Cobble content	0.61	Slope	0.00
		Too acid	0.50			Hard to reclaim (rock fragments)	0.00
						Too acid	0.59
Cedarcreek, bench	35	Fair		Fair		Poor	
		Organic matter content low	0.01	Cobble content	0.61	Rock fragments	0.00
		Droughty	0.07			Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Too acid	0.59
Rock outcrop, highwall	15	Not rated		Not rated		Not rated	
ChA:							
Chavies, rarely flooded	75	Fair		Good		Good	
		Too acid	0.84				
ClE:							
Clifftop	70	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.82	Slope	0.00	Rock fragments	0.32
		Droughty	0.86			Too acid	0.68
		Depth to bedrock	0.90			Too clayey	0.69
		Water erosion	0.99			Depth to bedrock	0.90
CnB:							
Clifftop	55	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.00
		Organic matter content low	0.82			Too acid	0.68
		Droughty	0.89			Too clayey	0.69
		Depth to bedrock	0.93			Depth to bedrock	0.93
		Too clayey	0.98				
Nallen	30	Fair		Poor		Fair	
		Organic matter content low	0.10	Depth to bedrock	0.00	Too acid	0.50
		Droughty	0.26			Depth to bedrock	0.84
		Too acid	0.50			Rock fragments	0.96
		Depth to bedrock	0.84				
		Water erosion	0.99				
CnC:							
Clifftop	50	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.00
		Organic matter content low	0.82			Slope	0.37
		Droughty	0.89			Too acid	0.68
		Depth to bedrock	0.93			Too clayey	0.69
		Too clayey	0.98			Depth to bedrock	0.93

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
CnC:							
Nallen	35	Fair		Poor		Fair	
		Organic matter content low	0.10	Depth to bedrock	0.00	Slope	0.37
		Droughty	0.26			Too acid	0.50
		Too acid	0.50			Depth to bedrock	0.84
		Depth to bedrock	0.84			Rock fragments	0.96
		Water erosion	0.99				
CnD:							
Clifftop	55	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Organic matter content low	0.82	Slope	0.50	Rock fragments	0.00
		Droughty	0.89			Too acid	0.68
		Depth to bedrock	0.93			Too clayey	0.69
		Too clayey	0.98			Depth to bedrock	0.93
Nallen	25	Fair		Poor		Poor	
		Organic matter content low	0.10	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.26	Slope	0.50	Too acid	0.50
		Too acid	0.50			Depth to bedrock	0.84
		Depth to bedrock	0.84			Rock fragments	0.96
CoA:							
Combs, occasionally flooded	85	Fair		Good		Fair	
		Too acid	0.92			Hard to reclaim (rock fragments)	0.40
						Rock fragments	0.68
CpA:							
Combs, occasionally flooded	45	Fair		Good		Fair	
		Too acid	0.92			Hard to reclaim (rock fragments)	0.40
						Rock fragments	0.68
Potomac, occasionally flooded	35	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.99	Rock fragments	0.00
		Droughty	0.39			Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.78			Too sandy	0.00
		Too acid	0.84				
CrB:							
Cookport	50	Fair		Fair		Fair	
		Too acid	0.01	Wetness depth	0.09	Wetness depth	0.09
		Organic matter content low	0.68	Depth to bedrock	0.46	Too acid	0.68
		Droughty	0.97				
Nallen	35	Fair		Poor		Fair	
		Organic matter content low	0.10	Depth to bedrock	0.00	Too acid	0.50
		Droughty	0.26			Depth to bedrock	0.84
		Too acid	0.50			Rock fragments	0.96
		Depth to bedrock	0.84				

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
CtB:							
Cotaco	75	Fair		Fair		Fair	
		Too acid	0.03	Wetness depth	0.53	Too acid	0.32
		Organic matter content low	0.08			Wetness depth	0.53
		Water erosion	0.99				
CxA:							
Craigsville, rarely flooded	90	Fair		Good		Poor	
		Too sandy	0.09			Rock fragments	0.00
		Too acid	0.50			Hard to reclaim (rock fragments)	0.00
						Too sandy	0.09
						Too acid	0.88
DkC:							
Dekalb	80	Fair		Poor		Poor	
		Droughty	0.01	Depth to bedrock	0.00	Rock fragments	0.00
		Too acid	0.50	Cobble content	0.29	Too acid	0.24
		Depth to bedrock	0.68			Depth to bedrock	0.68
		Cobble content	0.98			Slope	0.96
DrE:							
Dekalb	55	Fair		Poor		Poor	
		Droughty	0.01	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.68	Cobble content	0.29	Too acid	0.24
		Cobble content	0.98			Depth to bedrock	0.68
Rock outcrop	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin	80	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.32
		Depth to bedrock	0.54	Low strength	0.78	Depth to bedrock	0.54
		Droughty	0.57			Too acid	0.68
		Organic matter content low	0.82				
GaC:							
Gilpin	70	Fair		Poor		Fair	
		Droughty	0.46	Depth to bedrock	0.00	Rock fragments	0.32
		Too acid	0.50	Low strength	0.78	Depth to bedrock	0.54
		Depth to bedrock	0.54			Slope	0.63
		Organic matter content low	0.82			Too acid	0.68
GaD:							
Gilpin	70	Fair		Poor		Poor	
		Droughty	0.46	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.50	Rock fragments	0.32
		Depth to bedrock	0.54	Low strength	0.78	Depth to bedrock	0.54
		Organic matter content low	0.82			Too acid	0.68

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
GbE:							
Gilpin	60	Fair		Poor		Poor	
		Droughty	0.42	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.32
		Depth to bedrock	0.54	Low strength	0.78	Depth to bedrock	0.54
		Organic matter content low	0.82			Too acid	
Berks	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.97			Too acid	0.76
						Depth to bedrock	0.97
GhG:							
Gilpin	45	Fair		Poor		Poor	
		Droughty	0.18	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.21	Slope	0.00	Depth to bedrock	0.21
		Too acid	0.50	Low strength	0.78	Rock fragments	0.32
		Organic matter content low	0.82			Too acid	0.68
Highsplint	25	Fair		Poor		Poor	
		Too acid	0.26	Slope	0.00	Slope	0.00
		Organic matter content low	0.82			Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
						Too acid	0.82
Berks	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.84			Too acid	0.76
						Depth to bedrock	0.84
HgE:							
Highsplint	70	Fair		Poor		Poor	
		Too acid	0.26	Slope	0.00	Slope	0.00
		Organic matter content low	0.82			Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
						Too acid	0.82
ImC:							
Itmann	100	Fair		Good		Poor	
		Organic matter content low	0.01			Hard to reclaim (rock fragments)	0.00
		Too acid	0.74			Rock fragments	0.00
ImF:							
Itmann	100	Fair		Poor		Poor	
		Organic matter content low	0.01	Slope	0.00	Rock fragments	0.00
						Slope	0.00
		Too acid	0.74			Hard to reclaim (rock fragments)	0.00
KmC:							
Kaymine, bench	70	Fair		Fair		Poor	
		Stone content	0.04	Stones	0.24	Rock fragments	0.00
		Organic matter content low	0.18	Cobble content	0.98	Hard to reclaim (rock fragments)	0.00
		Too acid	0.74				

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
KrF:							
Kaymine, outslope	35	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.18	Stones	0.00	Rock fragments	0.00
		Too acid	0.74	Cobble content	0.93	Slope	0.00
Kaymine, bench	35	Fair		Fair		Poor	
		Stone content	0.04	Stones	0.24	Rock fragments	0.00
		Organic matter content low	0.18	Cobble content	0.98	Hard to reclaim (rock fragments)	0.00
		Too acid	0.74				
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	
KwA:							
Knowlton, rarely flooded	70	Fair		Poor		Poor	
		Organic matter content low	0.18	Wetness depth	0.00	Wetness depth	0.00
		Too acid	0.50	Low strength	0.00	Too acid	0.32
LaC:							
Laidig	70	Poor		Fair		Fair	
		Too acid	0.00	Wetness depth	0.94	Rock fragments	0.18
		Organic matter content low	0.56			Too acid	0.59
						Hard to reclaim (rock fragments)	0.68
						Wetness depth	0.94
						Slope	0.96
LeF:							
Layland	45	Fair		Poor		Poor	
		Too acid	0.03	Slope	0.00	Slope	0.00
		Organic matter content low	0.82			Hard to reclaim (rock fragments)	0.00
		Stone content	0.95			Rock fragments	0.00
						Too acid	0.59
Dekalb	30	Fair		Poor		Poor	
		Droughty	0.01	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.68	Cobble content	0.29	Too acid	0.24
		Cobble content	0.98			Depth to bedrock	0.68
Guyandotte	15	Fair		Poor		Poor	
		Too acid	0.32	Slope	0.00	Slope	0.00
		Stone content	0.37	Stones	0.53	Rock fragments	0.00
						Hard to reclaim (rock fragments)	0.00
						Too acid	0.92
LgG:							
Layland	45	Fair		Poor		Poor	
		Too acid	0.03	Slope	0.00	Slope	0.00
		Organic matter content low	0.82			Hard to reclaim (rock fragments)	0.00
		Stone content	0.95			Rock fragments	0.00
						Too acid	0.59

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
LgG:							
Dekalb	30	Fair		Poor		Poor	
		Droughty	0.01	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.00
		Depth to bedrock	0.58	Cobble content	0.22	Too acid	0.24
		Cobble content	0.96			Depth to bedrock	0.58
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Fair		Poor		Poor	
		Too acid	0.03	Slope	0.00	Slope	0.00
		Organic matter content low	0.82			Hard to reclaim (rock fragments)	0.00
		Stone content	0.88			Rock fragments	0.00
						Too acid	0.59
Laidig	25	Poor		Poor		Poor	
		Too acid	0.00	Slope	0.00	Slope	0.00
		Organic matter content low	0.56	Wetness depth	0.94	Rock fragments	0.18
						Too acid	0.59
						Hard to reclaim (rock fragments)	0.68
						Wetness depth	0.94
LlB:							
Lily	70	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Too acid	0.50
		Droughty	0.73			Depth to bedrock	0.92
		Organic matter content low	0.85			Rock fragments	0.96
		Depth to bedrock	0.92				
LlC:							
Lily	70	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Too acid	0.50
		Droughty	0.73			Slope	0.84
		Organic matter content low	0.85			Depth to bedrock	0.92
		Depth to bedrock	0.92			Rock fragments	0.96
LrA:							
Lithic Hapludolls, rarely flooded	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Stones	0.50	Rock fragments	0.00
		Stone content	0.50				
		Too acid	0.95				
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Not rated		Not rated		Not rated	
Rock outcrop	40	Not rated		Not rated		Not rated	

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
NfC:							
Nallen	65	Fair		Poor		Fair	
		Organic matter content low	0.10	Depth to bedrock	0.00	Slope	0.37
						Too acid	0.50
		Droughty	0.26			Depth to bedrock	0.84
		Too acid	0.50			Rock fragments	0.96
		Depth to bedrock	0.84				
Fenwick	15	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Wetness depth	0.18
		Droughty	0.81	Wetness depth	0.18	Slope	0.37
		Organic matter content low	0.92	Low strength	0.22	Too acid	0.59
						Rock fragments	0.92
		Water erosion	0.99				
PhA:							
Philo, occasionally flooded	50	Fair		Fair		Fair	
		Organic matter content low	0.12	Wetness depth	0.76	Wetness depth	0.76
						Hard to reclaim (rock fragments)	0.88
		Too acid	0.50				
						Rock fragments	0.88
						Too acid	0.98
Pope, occasionally flooded	30	Fair		Good		Poor	
		Too acid	0.50			Hard to reclaim (rock fragments)	0.00
						Too acid	0.59
						Rock fragments	0.92
PkC:							
Pipestem	85	Fair		Poor		Fair	
		Stone content	0.50	Low strength	0.00	Too clayey	0.41
		Too clayey	0.50	Stones		Hard to reclaim (rock fragments)	0.50
		Too acid	0.61		0.99		
						Rock fragments	0.61
						Slope	0.96
PmE:							
Pipestem	80	Fair		Poor		Poor	
		Stone content	0.11	Low strength	0.00	Slope	0.00
		Too clayey	0.50	Slope	0.08	Too clayey	0.41
		Too acid	0.61	Stones	0.57	Hard to reclaim (rock fragments)	0.50
						Rock fragments	0.86
PxA:							
Potomac, frequently flooded	60	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.97	Too sandy	0.00
		Droughty	0.39		0.97	Rock fragments	0.00
		Organic matter content low	0.78			Hard to reclaim (rock fragments)	0.00
		Too acid	0.84				
Nelse, frequently flooded	20	Fair		Good		Fair	
		Too sandy	0.22			Too sandy	0.22
		Too acid	0.99			Rock fragments	0.88
						Hard to reclaim (rock fragments)	0.98

Table 17.—Source of Reclamation Material, Roadfill, and Topsoil—Continued

Map unit symbol and soil name	Pct. of map unit	Source of reclamation material: Rating class and limiting features	Value	Roadfill source: Rating class and limiting features	Value	Topsoil source: Rating class and limiting features	Value
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
Ur:							
Udorthents, railroad grade	93	Not rated		Not rated		Not rated	
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 18.—Ponds and Embankments

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
AtA:							
Atkins, frequently flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.45	Depth to saturated zone	1.00	Unstable excavation walls	0.10
				Piping	1.00		
CaC:							
Cateache	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.65	Depth to water	1.00
		Seepage	0.70				
		Depth to bedrock	0.03				
CbD:							
Cateache	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.65	Depth to water	1.00
		Seepage	0.70				
		Depth to bedrock	0.03				
CbE:							
Cateache	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.65	Depth to water	1.00
		Seepage	0.70				
		Depth to bedrock	0.03				
CcG:							
Cateache	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.66	Depth to water	1.00
		Seepage	0.70				
		Depth to bedrock	0.03				
Pipestem	40	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
CfC:							
Cedarcreek, bench	75	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.30	Depth to water	1.00
		Slope	1.00				
CgF:							
Cedarcreek, outslope	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Seepage	0.30	Depth to water	1.00
		Seepage	1.00				
Cedarcreek, bench	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.30	Depth to water	1.00
		Slope	1.00				
Rock outcrop, highwall	15	Not rated		Not rated		Not rated	
ChA:							
Chavies, rarely flooded	75	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
ClE:							
Clifftop------------	70	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.70	Thin layer	0.70		
		Depth to bedrock	0.04				
CnB:							
Clifftop------------	55	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Depth to water	1.00
		Slope	0.50	Thin layer	0.66		
		Depth to bedrock	0.03				
Nallen--------------	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Depth to bedrock	0.74				
		Slope	0.68				
CnC:							
Clifftop------------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.70	Thin layer	0.66		
		Depth to bedrock	0.03				
Nallen--------------	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.74				
CnD:							
Clifftop------------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.70	Thin layer	0.66		
		Depth to bedrock	0.03				
Nallen--------------	25	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.74				
CoA:							
Combs, occasionally flooded------------	85	Very limited		Not limited		Somewhat limited	
		Seepage	1.00			Depth to saturated zone	0.96
						Unstable excavation walls	0.10
CpA:							
Combs, occasionally flooded------------	45	Very limited		Not limited		Somewhat limited	
		Seepage	1.00			Depth to saturated zone	0.96
						Unstable excavation walls	0.10
Potomac, occasionally flooded------------	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
CrB:							
Cookport------------	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Depth to saturated zone	1.00	Depth to water	1.00
		Slope	0.50	Piping	0.99		
		Depth to bedrock	0.13	Thin layer	0.13		
Nallen--------------	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Depth to bedrock	0.74				
		Slope	0.68				
CtB:							
Cotaco--------------	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
		Slope	0.50	Piping	0.14	Unstable excavation walls	0.10
CxA:							
Craigsville, rarely flooded------------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Unstable excavation walls	1.00
						Depth to saturated zone	0.96
DkC:							
Dekalb--------------	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.82	Depth to water	1.00
		Slope	1.00	Large stones	0.14		
		Depth to bedrock	0.82				
DrE:							
Dekalb--------------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.82	Depth to water	1.00
		Slope	1.00	Large stones	0.14		
		Depth to bedrock	0.82				
Rock outcrop--------	15	Not rated		Not rated		Not rated	
GaB:							
Gilpin--------------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Thin layer	0.86	Depth to water	1.00
		Slope	0.50	Piping	0.44		
		Depth to bedrock	0.11				
GaC:							
Gilpin--------------	70	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.86	Depth to water	1.00
		Seepage	0.70	Piping	0.28		
		Depth to bedrock	0.11				
GaD:							
Gilpin--------------	70	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.86	Depth to water	1.00
		Seepage	0.70	Piping	0.29		
		Depth to bedrock	0.11				

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
GbE:							
Gilpin	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.86	Depth to water	1.00
		Seepage	0.70	Piping	0.28		
		Depth to bedrock	0.11				
Berks	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.61	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.61				
GhG:							
Gilpin	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.95	Depth to water	1.00
		Seepage	0.70	Piping	0.25		
		Depth to bedrock	0.23				
Highsplint	25	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.70				
Berks	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.74				
HgE:							
Highsplint	70	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.70				
ImC:							
Itmann	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.75	Depth to water	1.00
		Slope	1.00				
ImF:							
Itmann	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
KmC:							
Kaymine, bench	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.91	Depth to water	1.00
		Slope	1.00	Large stones	0.04		
KrF:							
Kaymine, outslope	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Seepage	0.93	Depth to water	1.00
		Seepage	1.00	Large stones	0.32		
Kaymine, bench	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.91	Depth to water	1.00
		Slope	1.00	Large stones	0.04		
Rock outcrop, highwall	10	Not rated		Not rated		Not rated	

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
KwA:							
Knowlton, rarely flooded	70	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Unstable excavation walls	0.10
				Piping	0.74		
LaC:							
Laidig	70	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Depth to saturated zone	0.78	Depth to water	1.00
		Seepage	0.72				
LeF:							
Layland	45	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.73				
Dekalb	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.82	Depth to water	1.00
		Slope	1.00	Large stones	0.14		
		Depth to bedrock	0.82				
Guyandotte	15	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Seepage	0.44	Depth to water	1.00
		Seepage	1.00				
LgG:							
Layland	45	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.73				
Dekalb	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	Depth to water	1.00
		Slope	1.00	Large stones	0.14		
		Depth to bedrock	0.85				
Rock outcrop	10	Not rated		Not rated		Not rated	
LhE:							
Layland	60	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.73				
Laidig	25	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Depth to saturated zone	0.78	Depth to water	1.00
		Seepage	0.72				
LlB:							
Lily	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.68	Depth to water	1.00
		Depth to bedrock	0.68				
		Slope	0.50				
LlC:							
Lily	70	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.68	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.68				

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Pond reservoir areas: Value	Embankments, dikes, and levees: Rating class and limiting features	Embankments, dikes, and levees: Value	Aquifer-fed excavated ponds: Rating class and limiting features	Aquifer-fed excavated ponds: Value
LrA:							
Lithic Hapludolls, rarely flooded	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
				Seepage	0.87		
Rock outcrop	20	Not rated		Not rated		Not rated	
LxG:							
Lithic Udorthents, cut land	50	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
Rock outcrop	40	Not rated		Not rated		Not rated	
NfC:							
Nallen	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.74	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.74				
Fenwick	15	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to hard bedrock	1.00
		Seepage	0.70	Piping	0.77	Unstable excavation walls	0.50
		Depth to bedrock	0.52	Thin layer	0.52	Slow refill	0.30
PhA:							
Philo, occasionally flooded	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	0.95	Depth to saturated zone	0.02
Pope, occasionally flooded	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.62	Depth to water	1.00
PkC:							
Pipestem	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
PmE:							
Pipestem	80	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
PxA:							
Potomac, frequently flooded	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
Nelse, frequently flooded	20	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
Qs:							
Quarry, sandstone	100	Not rated		Not rated		Not rated	

Table 18.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
Rw:							
Riverwash, frequently flooded	95	Not rated		Not rated		Not rated	
UgC:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
UgF:							
Udorthents, graded	85	Not rated		Not rated		Not rated	
Ur:							
Udorthents, railroad grade	93	Not rated		Not rated		Not rated	
Uu:							
Udorthents, highways	70	Not rated		Not rated		Not rated	
Urban land, highways	25	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 19.—Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
AtA:												
Atkins, frequently flooded--------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-5	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	5-13	Loam, silt loam, mucky loam	SC, SM, CL, ML	A-6, A-4	0	0	85-100	66-100	50-95	33-69	20-35	1-15
	13-20	Loam	SC, SM, CL, ML	A-6, A-4	0	0	85-100	66-100	50-95	33-69	20-35	1-15
	20-66	Loam, silt loam, silty clay loam, fine sandy loam	SC, SM, CL, ML	A-6, A-4	0	0-4	90-100	71-100	55-100	37-82	20-40	3-20
	66-97	Silty clay loam, silt loam, loam, fine sandy loam	SC, SM, CL, ML	A-6, A-4	0	0-5	90-100	71-100	66-100	48-97	20-40	3-20
	97-165	Clay loam, stratified silty clay loam to gravelly sandy loam, sandy clay loam, silt loam	ML, SM, CL, GM	A-6, A-4, A-2-4	0	0-14	64-100	28-100	19-94	15-80	20-40	1-15
CaC:												
Cateache--------	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-9	Channery silt loam	ML, MH, CL, GC	A-7-6, A-6	0	0-7	69-89	46-89	42-89	38-87	35-66	12-24
	9-75	Channery silty clay loam, very channery silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	1-10	67-88	51-85	47-85	44-81	35-45	17-24
	75-92	Channery silty clay loam, silt loam, flaggy silty clay	CL, GC	A-7-6, A-6	0	7-31	77-95	46-91	41-91	37-91	34-53	17-32
	92-102	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CbD:												
Cateache--------	0-2	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	2-9	Channery silt loam	ML, MH, CL, GC	A-7-6, A-6	0	0-7	69-89	46-89	42-89	38-87	35-66	12-24
	9-75	Channery silty clay loam, very channery silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	1-10	67-88	51-85	47-85	44-81	35-45	17-24
	75-92	Channery silty clay loam, silt loam, flaggy silty clay	CL, GC	A-7-6, A-6	0	7-31	77-95	46-91	41-91	37-91	34-53	17-32
	92-102	Bedrock	---	---	---	---	---	---	---	---	---	---
CbE:												
Cateache--------	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-9	Channery silt loam	ML, MH, CL, GC	A-7-6, A-6	0	0-7	69-89	46-89	42-89	38-87	35-66	12-24
	9-75	Channery silty clay loam, very channery silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	1-10	67-88	51-85	47-85	44-81	35-45	17-24
	75-92	Channery silty clay loam, silt loam, flaggy silty clay	CL, GC	A-7-6, A-6	0	7-31	77-95	46-91	41-91	37-91	34-53	17-32
	92-102	Bedrock	---	---	---	---	---	---	---	---	---	---
CcG:												
Cateache--------	0-8	Channery silt loam	ML, MH, CL, GC	A-7-6, A-6	0	0-7	69-89	46-89	42-89	38-87	35-66	12-24
	8-74	Channery silty clay loam, very channery silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	0-10	56-88	43-88	40-88	37-84	35-45	17-24
	74-91	Channery silty clay loam, silt loam, flaggy silty clay	CL, GC	A-7-6, A-6	0	7-31	77-95	46-91	41-91	37-91	34-53	17-32
	91-101	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CcG:												
Pipestem	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-11	Flaggy silt loam, channery silty clay loam, silty clay loam	MH, ML, CL	A-7-6, A-6	0	3-46	67-96	66-96	63-96	58-95	40-70	15-23
	11-137	Channery silt loam, silty clay, stony silty clay loam	CL, CH, GC	A-7-6, A-6	0-34	4-38	59-96	58-96	54-96	49-96	34-59	17-32
	137-200	Channery silt loam, very flaggy silty clay, very stony silty clay loam	CL, CH, GC	A-7-6, A-6	3-43	6-36	48-96	47-96	44-96	40-96	34-54	17-32
CfC:												
Cedarcreek, bench	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-10	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	10-25	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	25-165	Extremely channery loam	GC, GM	A-6, A-2-6, A-2-4	0	18-32	23-62	21-61	16-58	11-44	18-37	3-19
CgF:												
Cedarcreek, outslope	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-10	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	10-25	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	25-165	Extremely channery loam	GC, GM	A-6, A-2-6, A-2-4	0	18-32	23-62	21-61	16-58	11-44	18-37	3-19
Cedarcreek, bench	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-10	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	10-25	Very channery loam	GC, GM	A-6, A-2-6, A-2-4	0	16-26	43-67	41-66	33-64	24-50	19-38	3-19
	25-165	Extremely channery loam	GC, GM	A-6, A-2-6, A-2-4	0	18-32	23-62	21-61	16-58	11-44	18-37	3-19

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >250 mm	Fragments 75-250 mm	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CgF:												
Rock outcrop, highwall.												
ChA:												
Chavies, rarely flooded	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-28	Fine sandy loam	SM, ML	A-2-4, A-4	0	0	89-100	69-100	59-99	27-53	0-39	NP-9
	28-107	Fine sandy loam, sandy loam, loam	SC, CL	A-2-6, A-4	0	0	90-100	72-100	61-98	28-52	17-33	2-12
	107-165	Sandy loam, gravelly fine sandy loam, loam, loamy sand	SM, SC-SM	A-4, A-2-4, A-1-b	0	0-4	79-100	52-100	35-85	16-47	0-31	NP-12
ClE:												
Clifftop	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-8	Channery silt loam	GC, CL, GM, ML	A-2, A-4	0	0-57	64-100	27-100	21-97	17-80	25-36	5-10
	8-20	Silt loam, channery silt loam, channery loam	ML, CL	A-6, A-4	0	0-5	81-94	63-94	55-90	45-75	27-43	9-12
	20-74	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	SC, CL, CL-ML, GC-GM	A-5, A-4, A-7	0	0-24	69-96	39-96	34-96	30-89	20-45	4-15
	74-91	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-1, A-2, A-4, A-6	0	0-23	48-71	24-71	20-71	18-70	20-40	4-15
	89-101	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >250 mm	Fragments 75-250 mm	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CnB:												
Clifftop--------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-8	Channery silt loam	CL, GM, ML, GC	A-4, A-2	0	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	8-20	Silt loam, channery silt loam, channery loam	CL, ML	A-4, A-6	0	0-5	80-95	75-90	70-85	65-80	27-43	9-12
	20-74	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	SC, CL-ML, GC-GM, CL	A-4, A-7, A-5	0	0-30	50-95	45-90	35-85	30-80	20-45	4-15
	74-91	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC, GC-GM	A-1, A-2, A-4, A-6	0-15	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	91-101	Bedrock	---	---	---	---	---	---	---	---	---	---
Nallen----------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-4	Moderately decomposed plant material	PT	A-8	0	0-7	---	---	---	---	---	---
	4-13	Loam	ML, SM, CL-ML	A-4, A-5	0	0-7	88-100	71-100	62-100	36-71	29-54	5-11
	13-23	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-4, A-5	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	23-48	Channery sandy loam, loam, fine sandy loam	CL, SC, SC-SM	A-4, A-6	0	0-12	86-100	72-100	61-100	36-70	21-34	5-14
	48-86	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-1-b, A-4, A-2-4	0	2-38	70-97	41-96	32-96	15-53	16-28	2-12
	86-96	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CnC:												
Clifftop--------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-8	Channery silt loam	CL, GM, ML, GC	A-4, A-2	0	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	8-20	Silt loam, channery silt loam, channery loam	ML, CL	A-6, A-4	0	0-5	80-95	75-90	70-85	65-80	27-43	9-12
	20-74	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	CL, SC, CL-ML, GC-GM	A-7, A-5, A-4	0	0-30	50-95	45-90	35-85	30-80	20-45	4-15
	74-91	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-1, A-6, A-2, A-4	0-15	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	91-101	Bedrock	---		---	---	---	---	---	---	---	---
Nallen----------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-4	Moderately decomposed plant material	PT	A-8	0	0-7	---	---	---	---	---	---
	4-13	Loam	ML, SM, CL-ML	A-5, A-4	0	0-7	88-100	71-100	62-100	36-71	29-54	5-11
	13-23	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-5, A-4	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	23-48	Channery sandy loam, loam, fine sandy loam	CL, SC, SC-SM	A-4, A-6	0	0-12	86-100	72-100	61-100	36-70	21-34	5-14
	48-86	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-4, A-2-4, A-1-b	0	2-38	70-97	41-96	32-96	15-53	16-28	2-12
	86-96	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CnD:												
Clifftop--------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-8	Channery silt loam	GC, GM, ML, CL	A-2, A-4	0	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	8-20	Silt loam, channery silt loam, channery loam	CL, ML	A-6, A-4	0	0-5	80-95	75-90	70-85	65-80	27-43	9-12
	20-74	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	CL, SC, CL-ML, GC-GM	A-5, A-4, A-7	0	0-30	50-95	45-90	35-85	30-80	20-45	4-15
	74-91	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-2, A-4, A-1, A-6	0-15	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	91-101	Bedrock	---	---	---	---	---	---	---	---	---	---
Nallen----------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-4	Moderately decomposed plant material	PT	A-8	0	0-7	---	---	---	---	---	---
	4-13	Loam	ML, SM, CL-ML	A-4, A-5	0	0-7	88-100	71-100	62-100	36-71	29-54	5-11
	13-23	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-5, A-4	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	23-48	Channery sandy loam, loam, fine sandy loam	SC-SM, CL, SC	A-4, A-6	0	0-12	86-100	72-100	61-100	36-70	21-34	5-14
	48-86	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-4, A-2-4, A-1-b	0	2-38	70-97	41-96	32-96	15-53	16-28	2-12
	86-96	Bedrock	---	---	---	---	---	---	---	---	---	---
CoA:												
Combs, occasionally flooded--------	0-25	Fine sandy loam	SM, SC-SM	A-2, A-4	0	0	91-100	70-100	59-98	25-49	23-44	2-12
	25-122	Fine sandy loam, loam, sandy loam	SM, SC-SM	A-4, A-2	0	0	91-100	68-100	58-98	25-49	17-33	2-12
	122-200	Cobbly sandy loam, sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2	0	0-22	89-100	62-100	44-84	20-46	17-33	2-12

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CpA:												
Combs, occasionally flooded--------	0-25	Fine sandy loam	SM, SC-SM	A-2, A-4	0-3	0	91-100	70-100	59-98	25-49	23-44	2-12
	25-122	Fine sandy loam, loam, sandy loam	SM, SC-SM	A-4, A-2	0	0	91-100	68-100	58-98	25-49	17-33	2-12
	122-200	Cobbly sandy loam, sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2	0	0-26	91-100	70-100	50-84	23-46	17-33	2-12
Potomac, occasionally flooded--------	0-2	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	2-20	Gravelly sandy loam	SM, GM	A-2-4, A-2-5, A-5	0	6-27	49-93	45-93	30-77	14-43	0-41	NP-9
	20-200	Stratified very gravelly sand to very gravelly loamy sand, extremely gravelly sandy loam, very gravelly loamy sand, extremely gravelly sand	GM, GW-GM	A-1	0	7-43	47-78	8-78	6-72	2-31	15-15	NP-3
CrB:												
Cookport--------	0-3	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-8	Loam	ML, SM	A-5, A-6	0	0-5	73-100	45-100	34-100	24-77	0-68	NP-17
	8-23	Channery sandy loam, loam, silt loam	ML, CL, SM	A-4, A-6	0	0-14	78-100	55-100	45-95	31-70	22-45	4-14
	23-56	Sandy clay loam, clay loam, channery loam, loam	CL, SC	A-6, A-4, A-2-4	0	0-25	79-100	50-100	39-100	26-77	20-43	4-23
	56-107	Sandy clay loam, clay loam, channery loam, loam	CL, CL-ML, SC	A-6, A-4, A-2-4	0	0-23	80-100	54-100	42-100	28-79	19-45	4-24
	107-124	Sandy loam, very channery sandy clay loam, channery loam	SC, GC, CL	A-4, A-6, A-2-4	0	2-32	73-96	32-88	22-77	12-51	18-37	3-18
	124-134	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>250 mm	75-250 mm	4	10	40	200		
	Cm				Pct	Pct					Pct	
CrB:												
Nallen----------	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-4	Moderately decomposed plant material	PT	A-8	0	0-7	---	---	---	---	---	---
	4-13	Loam	ML, SM, CL-ML	A-5, A-4	0	0-7	88-100	71-100	62-100	36-71	29-54	5-11
	13-23	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-4, A-5	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	23-48	Channery sandy loam, loam, fine sandy loam	SC, SC-SM, CL	A-4, A-6	0	0-12	86-100	72-100	61-100	36-70	21-34	5-14
	48-86	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-1-b, A-4, A-2-4	0	2-38	70-97	41-96	32-96	15-53	16-28	2-12
	86-96	Bedrock	---	---	---	---	---	---	---	---	---	---
CtB:												
Cotaco----------	0-4	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-6	Moderately decomposed plant material	PT	A-8	0	0-22	---	---	---	---	---	---
	6-23	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	89-100	74-100	60-100	45-80	23-45	4-18
	23-30	Loam, silt loam	CL, CL-ML, GC	A-6, A-4, A-2-4	0	0-9	77-100	50-100	40-99	29-78	23-45	4-18
	30-53	Gravelly silt loam, clay loam, loam, silty clay loam	CL, GC	A-6, A-7-6	0	0-12	78-100	52-100	43-100	34-87	27-49	12-28
	53-93	Loam, clay loam, gravelly silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	0-13	77-100	52-100	43-100	33-85	31-54	11-26
	93-123	Clay loam, loam, gravelly silt loam, silty clay loam	CL, GC	A-6, A-7-6	0	0-22	78-100	52-100	43-100	33-83	27-47	12-27
	123-200	Clay loam, gravelly silt loam, very cobbly loam, silty clay loam	CL, GC	A-6, A-7-6, A-2-6	0	0-32	75-100	42-100	34-100	26-83	27-49	12-28

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
CxA:												
Craigsville, rarely flooded	0-5	Slightly decomposed plant material	PT	A-8	18-30	7-13	---	---	---	---	---	---
	5-8	Moderately decomposed plant material	PT	A-8	17-29	6-14	---	---	---	---	---	---
	8-21	Very gravelly loam, very gravelly sandy loam	SM, SC	A-2-4, A-1-a, A-4	0	0-8	58-92	16-84	11-73	5-42	0-41	NP-13
	21-60	Extremely gravelly loam, very gravelly sandy loam	SM, SC, GM	A-2-4, A-1-a	0	0-7	56-74	12-54	8-47	4-27	0-35	NP-13
	60-200	Extremely gravelly sandy loam, extremely gravelly loamy coarse sand	SM, GM, GC	A-2-4, A-1-a	0	0-14	54-74	8-54	4-35	1-17	0-30	NP-10
DkC:												
Dekalb	0-1	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	1-3	Moderately decomposed plant material	PT	A-8	24-42	0	---	---	---	---	---	---
	3-8	Highly organic very channery sandy loam, channery highly organic loam, very channery sandy loam	GM, ML, SM	A-2-5, A-2-4, A-5	0	12-36	65-95	30-91	24-80	14-52	33-69	1-8
	8-20	Very channery sandy loam, channery loam	SM, ML, GM	A-2-4, A-2-5, A-5	0	11-33	64-92	30-92	24-83	14-56	21-43	2-11
	20-65	Very channery loam, channery loam, very channery sandy loam	GC, GM, SM, ML	A-4, A-2-4	0-8	4-40	64-91	32-91	24-84	16-60	18-35	2-13
	65-80	Very channery sandy loam, very flaggy loamy sand, extremely channery loam	SC, SM, GC, GM	A-2-4, A-4	4-20	19-63	57-88	9-88	7-80	5-55	17-32	2-12
	80-90	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
DrE:												
Dekalb----------	0-1	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	1-3	Moderately decomposed plant material	PT	A-8	24-42	0	---	---	---	---	---	---
	3-8	Highly organic very channery sandy loam, channery highly organic loam, very channery sandy loam	SM, GM, ML	A-2-5, A-2-4, A-5	0	12-36	65-95	30-91	24-80	14-52	33-69	1-8
	8-20	Very channery sandy loam, channery loam	SM, ML, GM	A-2-4, A-2-5, A-5	0	11-33	64-92	30-92	24-83	14-56	21-43	2-11
	20-65	Very channery loam, channery loam, very channery sandy loam	GC, GM, SM, ML	A-4, A-2-4	0-8	4-40	64-91	32-91	24-84	16-60	18-35	2-13
	65-80	Very channery sandy loam, very flaggy loamy sand, extremely channery loam	SM, GM, SC, GC	A-2-4, A-4	4-20	19-63	57-88	9-88	7-80	5-55	17-32	2-12
	80-90	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
GaB:												
Gilpin----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-16	Loam	ML, CL, GC, GM	A-4, A-2	0	0-51	66-100	32-100	24-94	19-77	18-42	2-15
	16-29	Channery silt loam	CL, GC, GM, ML	A-4, A-2	0	0-51	66-100	32-100	26-100	20-84	0-44	NP-18
	29-70	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	CL, CL-ML, GC-GM, SC	A-7, A-6, A-4, A-5	0	0-24	69-96	39-96	35-96	31-92	30-47	13-24
	70-76	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC, GC-GM	A-2, A-4, A-1, A-6	0	0-23	48-71	24-71	21-71	19-71	20-40	4-15
	76-96	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
GaC:												
Gilpin----------	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	24-94	19-77	18-42	2-15
	10-32	Channery silt loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	26-100	20-84	0-44	NP-18
	32-63	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	GC-GM, SC, CL, CL-ML	A-5, A-6, A-7, A-4	0	0-24	69-96	39-96	35-96	31-92	30-47	13-24
	63-76	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-4, A-6, A-1, A-2	0	0-23	48-71	24-71	21-71	19-71	30-51	13-30
	76-96	Bedrock	---	---	---	---	---	---	---	---	---	---
GaD:												
Gilpin----------	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	24-94	19-77	18-42	2-15
	8-32	Channery silt loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	26-100	20-84	0-44	NP-18
	32-63	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	GC-GM, SC, CL, CL-ML	A-5, A-6, A-7, A-4	0	0-24	69-96	39-96	35-96	31-92	30-47	13-24
	63-76	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-4, A-6, A-1, A-2	0	0-23	48-71	24-71	21-71	19-71	30-51	13-30
	76-96	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
GbE:												
Gilpin----------	0-3	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	3-8	Loam	GC, GM, ML, CL	A-4, A-2	0-4	0-51	66-100	32-100	24-94	19-77	18-42	2-15
	8-32	Channery silt loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	26-100	20-84	0-44	NP-18
	32-63	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	GC-GM, SC, CL, CL-ML	A-5, A-6, A-7, A-4	0	0-24	69-96	39-96	35-96	31-92	30-47	13-24
	63-76	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-4, A-6, A-1, A-2	0	0-23	48-71	24-71	21-71	19-71	30-51	13-30
	76-96	Bedrock	---	---	---	---	---	---	---	---	---	---
Berks-----------	0-3	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	3-13	Channery loam, channery silt loam	SM, GM	A-4, A-2	0	5-36	25-93	22-93	19-93	16-85	36-55	8-15
	13-24	Channery loam, channery silt loam	SC, SM, GC, GM	A-4, A-2	0	5-44	15-94	13-93	11-93	9-82	27-43	9-15
	24-85	Very channery loam, very channery silt loam	GC-GM, SC, GC	A-4, A-2	0	8-42	19-91	16-90	14-90	12-83	26-37	9-15
	85-94	Extremely channery loam, extremely channery silt loam	GC-GM, GC	A-2	0-23	7-65	9-81	6-80	6-80	5-77	27-37	11-18
	94-104	Bedrock	---	---	---	---	---	---	---	---	---	---
GhG:												
Gilpin----------	0-5	Loam	GC, GM, ML, CL	A-4, A-2	0-4	0-51	66-100	32-100	24-94	19-77	18-42	2-15
	5-22	Channery silt loam	GC, GM, ML, CL	A-4, A-2	0	0-51	66-100	32-100	26-100	20-84	0-44	NP-18
	22-53	Channery silty clay loam, channery silt loam, channery loam, silty clay loam	GC-GM, SC, CL, CL-ML	A-5, A-6, A-7, A-4	0	0-24	69-96	39-96	36-96	31-93	30-47	13-24
	53-66	Very channery silty clay loam, very channery silt loam, channery loam, channery silty clay	GC-GM, GC	A-4, A-6, A-1, A-2	0	0-23	48-71	24-71	21-71	19-71	30-51	13-30
	66-86	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
GhG:												
Highsplint------	0-1	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	1-18	Channery loam, very channery silt loam	GM, ML	A-7-6, A-2-4, A-2-7	0	5-20	54-86	31-79	27-78	20-62	33-56	9-18
	18-27	Channery loam, very channery silt loam	GC, GM, ML, CL	A-6, A-2-4, A-2-6	0	6-25	61-86	43-79	36-77	28-61	27-42	9-18
	27-108	Very channery loam, very channery silt loam, very channery clay loam	GC, SC, CL	A-6, A-2-6, A-2-4, A-4	0	5-22	37-80	24-72	21-72	16-58	24-42	9-21
	108-135	Very channery loam, very channery silt loam	GC, SC	A-2-6, A-2-4, A-4	0	10-26	27-68	14-64	11-63	8-49	18-37	3-18
	135-165	Extremely channery loam, extremely channery fine sandy loam, very channery silt loam	GC, SC, CL	A-2-6, A-2-4, A-4	0-31	9-36	26-82	12-79	10-77	7-57	24-38	9-18
Berks-----------	0-5	Channery loam, channery silt loam	SM, GM	A-4, A-2	0	5-36	25-93	22-93	19-93	16-85	36-55	8-15
	5-16	Channery loam, channery silt loam	SC, SM, GC, GM	A-4, A-2	0	5-44	15-94	13-93	11-93	9-82	27-43	9-15
	16-77	Very channery loam, very channery silt loam	GC-GM, SC, GC	A-4, A-2	0	8-42	19-91	16-90	14-90	12-83	26-37	9-15
	77-86	Extremely channery loam, extremely channery silt loam	GC-GM, GC	A-2	0-23	7-65	9-81	6-80	6-80	5-77	27-37	11-18
	86-96	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
HgE:												
Highsplint------	0-3	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	3-18	Channery loam, very channery silt loam	GM, ML	A-7-6, A-2-4, A-2-7	0-3	0-17	52-87	36-81	31-80	23-63	33-56	9-18
	18-27	Channery loam, very channery silt loam	GC, GM, ML, CL	A-6, A-2-4, A-2-6	0	7-31	61-86	43-79	36-77	28-61	27-42	9-18
	27-108	Very channery loam, very channery silt loam, very channery clay loam	GC, SC, CL	A-6, A-2-6, A-2-4, A-4	0	6-27	37-80	24-72	20-72	16-58	24-42	9-21
	108-135	Very channery loam, very channery silt loam	GC, SC	A-2-6, A-2-4, A-4	0	11-34	27-68	14-64	12-63	9-49	24-37	9-18
	135-165	Extremely channery loam, extremely channery fine sandy loam, very channery silt loam	GC, SC, CL	A-2-6, A-2-4, A-4	0-43	11-45	26-82	12-79	10-77	7-57	24-38	9-18
ImC:												
Itmann----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-9	Very channery sandy loam	GM, GC-GM	A-2-4, A-1	0	0-10	40-55	35-50	25-45	15-35	15-25	NP-7
	9-165	Extremely channery sandy loam, very channery sandy loam, extremely channery loam, very channery loam	GM, GC-GM	A-2-4, A-1	0	0-15	30-55	25-50	20-45	10-35	15-25	NP-7
ImF:												
Itmann----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-9	Very channery sandy loam	GM, GC-GM	A-2-4, A-1	0	0-6	37-62	16-62	12-51	6-29	19-27	3-10
	9-165	Extremely channery sandy loam, very channery sandy loam, extremely channery loam, very channery loam	GM, GC-GM	A-2-4, A-1	0	0-9	36-63	12-63	9-52	4-29	15-26	1-10

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
KmC:												
Kaymine, bench--	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-33	Channery loam, extremely channery loam	GC	A-6, A-2-6, A-2, A-4	0	12-18	48-75	13-75	11-71	9-56	28-43	12-18
	33-165	Extremely channery loam, very stony silt loam, very channery loam	GC	A-6, A-2-6, A-2, A-4	0-32	11-18	47-70	13-70	11-66	9-52	27-37	12-19
KrF:												
Kaymine, outslope-------	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-33	Channery loam, extremely channery loam	GC	A-6, A-2-6, A-2, A-4	0-30	11-26	45-75	13-75	11-71	9-56	28-43	12-18
	33-165	Extremely channery loam, very stony silt loam, very channery loam	GC	A-6, A-2-6, A-2, A-4	0-32	11-18	47-70	13-70	11-66	9-52	27-37	12-19
Kaymine, bench--	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-33	Channery loam, extremely channery loam	GC	A-6, A-2-6, A-2, A-4	0	12-18	48-75	13-75	11-71	9-56	28-43	12-18
	33-165	Extremely channery loam, very stony silt loam, very channery loam	GC	A-6, A-2-6, A-2, A-4	0-32	11-18	47-70	13-70	11-66	9-52	27-37	12-19
Rock outcrop, highwall.												
KwA:												
Knowlton, rarely flooded-	0-2	Moderately decomposed plant material	PT	A-8	0	0-22	---	---	---	---	---	---
	2-25	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	89-100	74-100	59-99	43-78	27-53	4-18
	25-43	Loam, silt loam	CL, CL-ML, GC	A-6, A-4, A-2-4	0	0-7	77-100	50-100	42-100	31-82	20-38	4-19
	43-56	Gravelly silt loam, clay loam, loam, silty clay loam	CL, GC	A-6, A-7-6	0	0-10	78-100	52-100	39-94	30-77	18-38	3-19
	56-165	Loam, clay loam, gravelly silt loam, silty clay loam	CL, GC	A-7-6, A-6	0	0-9	79-100	56-100	43-100	32-88	18-47	3-27

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LaC:												
Laidig----------	0-2	Stony slightly decomposed plant material	PT	A-8	45-85	11-31	---	---	---	---	---	---
	2-9	Very gravelly loam, silt loam, gravelly highly organic loam	SM, GM, ML	A-2-5, A-4, A-5	0	0-14	39-89	30-87	23-83	16-62	0-69	NP-13
	9-19	Very gravelly loam, silt loam, gravelly loam	CL, GM, SM, CL-ML	A-6, A-4, A-2-6	0	0-12	47-91	39-89	33-88	24-69	26-44	7-17
	19-80	Very gravelly loam, silt loam, gravelly loam	CL, CL-ML, SC	A-6, A-4, A-2-6	0	0-13	56-97	44-95	36-92	27-73	23-38	7-18
	80-122	Very gravelly clay loam, silt loam, gravelly loam, gravelly silt loam	CL, CL-ML, SC	A-6, A-4, A-2-6	0	0-10	50-92	42-91	35-91	26-74	25-44	9-24
	122-200	Gravelly loam, loam, very gravelly sandy loam, very gravelly clay loam	SC, CL, CL-ML	A-6, A-4, A-2-6	0-13	0-31	44-93	32-90	26-90	18-69	22-40	6-21

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LeF:												
Layland---------	0-3	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	3-5	Moderately decomposed plant material	PT	A-8	24-42	0	---	---	---	---	---	---
	5-15	Gravelly loam, very gravelly loam, silt loam	SM, GM, ML	A-7-5, A-2-5	0	0-38	20-90	17-90	15-90	11-69	42-78	10-12
	15-23	Gravelly loam, very gravelly loam, silt loam	SC, GC, ML	A-6, A-2-6	0	0-37	22-92	20-91	18-91	13-72	31-40	11-14
	23-117	Gravelly loam, very gravelly loam, silt loam	SC, GC	A-6, A-2-6	0-35	0-45	25-93	23-93	20-93	15-72	28-39	12-18
	117-145	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-6, A-2-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20
	145-200	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-2-6, A-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20
Dekalb----------	0-1	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	1-3	Moderately decomposed plant material	PT	A-8	24-42	0	---	---	---	---	---	---
	3-8	Highly organic very channery sandy loam, channery highly organic loam, very channery sandy loam	GM, ML, SM	A-2-5, A-2-4, A-5	0	12-36	65-95	30-91	24-80	14-52	33-69	1-8
	8-20	Very channery sandy loam, channery loam	ML, GM, SM	A-2-4, A-2-5, A-5	0	11-33	64-92	30-92	24-83	14-56	21-43	2-11
	20-65	Very channery loam, channery loam, very channery sandy loam	GC, GM, SM, ML	A-4, A-2-4	0-8	4-40	64-91	32-91	24-84	16-60	18-35	2-13
	65-80	Very channery sandy loam, very flaggy loamy sand, extremely channery loam	GC, SM, GM, SC	A-2-4, A-4	4-20	19-63	57-88	9-88	7-80	5-55	17-32	2-12
	80-90	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LeF:												
Guyandotte------	0-2	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	2-31	Very gravelly loam, gravelly silt loam, very gravelly sandy loam	GM, SM, ML	A-2-5, A-2-4, A-4	4-16	6-22	23-88	15-86	11-77	6-52	25-61	5-12
	31-46	Very gravelly loam, gravelly silt loam, very gravelly sandy loam	GC, SC, CL-ML	A-2-6, A-2-4, A-6	4-12	1-17	30-84	23-82	17-74	11-52	24-38	6-17
	46-140	Very gravelly loam, gravelly silt loam, very gravelly sandy loam	GC, SC, CL-ML	A-2-4, A-2-6, A-6	4-24	7-27	32-88	24-86	18-78	12-57	21-39	6-18
	140-200	Extremely gravelly loam, very gravelly silt loam, very flaggy sandy loam	GC, SC, CL-ML	A-2-4, A-2-6, A-6	4-23	6-26	31-81	25-79	19-73	13-54	21-36	6-17
LgG:												
Layland---------	0-3	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	3-5	Moderately decomposed plant material	PT	A-8	24-42	24-58	---	---	---	---	---	---
	5-15	Gravelly loam, very gravelly loam, silt loam	SM, GM, ML	A-2-5, A-7-5	0	0-38	20-90	17-90	15-90	11-69	42-78	10-12
	15-23	Gravelly loam, very gravelly loam, silt loam	SC, GC, ML	A-6, A-2-6	0	0-37	22-92	20-91	18-91	13-72	31-40	11-14
	23-117	Gravelly loam, very gravelly loam, silt loam	SC, GC	A-2-6, A-6	0-35	0-45	25-93	23-93	20-93	15-72	28-39	12-18
	117-145	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-6, A-2-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20
	145-200	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-6, A-2-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LgG:												
Dekalb----------	0-5	Very channery highly organic sandy loam, channery highly organic loam, very channery sandy loam	SM, GM, ML	A-2-5, A-2-4, A-5	0	12-36	65-95	30-91	24-80	14-52	33-69	1-8
	5-17	Very channery sandy loam, channery loam	GM, SM, ML	A-2-4, A-2-5, A-5	0	11-33	64-92	30-92	24-83	14-56	21-43	2-11
	17-62	Very channery loam, channery loam, very channery sandy loam	GC, GM, SM, ML	A-4, A-2-4	0-8	4-40	64-91	32-91	24-84	16-60	18-35	2-13
	62-77	Very channery sandy loam, very flaggy loamy sand, extremely channery loam	GM, SC, GC, SM	A-4, A-2-4	4-20	19-63	57-88	9-88	7-80	5-55	17-32	2-12
	77-87	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
LhE:												
Layland---------	0-3	Stony slightly decomposed plant material	PT	A-8	45-85	0	---	---	---	---	---	---
	3-5	Stony moderately decomposed plant material	PT	A-8	44-84	0	---	---	---	---	---	---
	5-15	Gravelly loam, very gravelly loam, silt loam	SM, GM, ML	A-2-5, A-7-5	0	0-38	20-90	17-90	15-90	11-69	42-78	10-12
	15-23	Gravelly loam, very gravelly loam, silt loam	SC, GC, ML	A-6, A-2-6	0	0-37	22-92	20-91	18-91	13-72	31-40	11-14
	23-117	Gravelly loam, very gravelly loam, silt loam	SC, GC	A-6, A-2-6	0-35	0-45	25-93	23-93	20-93	15-72	28-39	12-18
	117-145	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-6, A-2-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20
	145-200	Very gravelly loam, gravelly silt loam, extremely flaggy clay loam, extremely channery silty clay loam	SC, GC	A-6, A-2-6	4-60	23-93	11-79	8-78	7-78	5-65	27-38	11-20

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LhE:												
Laidig----------	0-2	Stony slightly decomposed plant material	PT	A-8	45-85	0	---	---	---	---	---	---
	2-9	Very gravelly loam, silt loam, gravelly highly organic loam	SM, GM, ML	A-2-5, A-4, A-5	0	0-14	39-89	30-87	23-83	16-62	0-69	NP-13
	9-19	Very gravelly loam, silt loam, gravelly loam	CL, GM, SM, CL-ML	A-6, A-4, A-2-6	0	0-12	47-91	39-89	33-88	24-69	26-44	7-17
	19-80	Very gravelly loam, silt loam, gravelly loam	CL, CL-ML, SC	A-6, A-4, A-2-6	0	0-13	56-97	44-95	36-92	27-73	23-38	7-18
	80-122	Very gravelly clay loam, gravelly silt loam, gravelly loam	CL, CL-ML, SC	A-6, A-4, A-2-6	0	0-10	50-92	42-91	35-91	26-74	25-44	9-24
	122-200	Gravelly loam, very gravelly clay loam, very gravelly sandy loam	SC, CL, CL-ML	A-6, A-4, A-2-6	0-13	0-31	44-93	32-90	26-90	18-69	22-40	6-21
LlB:												
Lily------------	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	5-11	Loam	ML, SM, CL-ML	A-5, A-4	0	0-6	88-100	71-100	62-100	36-71	29-54	5-11
	11-19	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-4, A-5	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	19-78	Channery sandy loam, loam, fine sandy loam	SC, SC-SM, CL	A-6, A-4	0	0-11	86-100	72-100	58-100	39-74	27-39	10-19
	78-90	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-2-4, A-1-b, A-4	0	2-35	70-97	41-96	31-96	15-53	16-28	2-12
	90-100	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LlC:												
Lily	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	5-11	Loam	ML, SM, CL-ML	A-4, A-5	0	0-6	88-100	71-100	62-100	36-71	29-54	5-11
	11-19	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-5, A-4	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	19-78	Channery sandy loam, loam, fine sandy loam	SC-SM, CL, SC	A-4, A-6	0	0-11	86-100	72-100	58-100	39-74	27-39	10-19
	78-90	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-4, A-2-4, A-1-b	0	2-35	70-97	41-96	31-96	15-53	16-28	2-12
	90-100	Bedrock	---	---	---	---	---	---	---	---	---	---
LrA:												
Lithic Hapludolls, rarely flooded	0-20	Gravelly loam, very gravelly fine sandy loam, fine sandy loam	SM, GM, ML	A-4, A-2-4	12-26	0-5	31-87	7-82	5-78	3-55	24-55	1-11
	20-38	Very gravelly loam, very gravelly fine sandy loam, gravelly fine sandy loam	SM, GM, ML	A-2-4, A-4	0	0-24	38-80	16-76	13-72	8-51	24-55	1-11
	38-46	Extremely gravelly loam, very gravelly fine sandy loam	GM, SM, GC	A-2-4, A-4	0	13-32	33-68	9-60	7-56	5-40	17-40	1-12
	46-56	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
LxG:												
Lithic Udorthents, cut land	0-10	Gravelly sandy loam, very gravelly clay loam, very gravelly loam, extremely channery silt loam	---	---	---	---	---	---	---	---	---	---
	10-22	Gravelly sandy loam, very gravelly clay loam, extremely channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	22-32	Bedrock	---	---	---	---	---	---	---	---	---	---

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
LxG:												
Rock outcrop.												
NfC:												
Nallen----------	0-3	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	3-4	Moderately decomposed plant material	PT	A-8	1-24	0	---	---	---	---	---	---
	4-13	Loam	ML, SM, CL-ML	A-4, A-5	0	0-7	88-100	71-100	62-100	36-71	29-54	5-11
	13-23	Channery sandy loam, loam, fine sandy loam	ML, CL, SC, SM	A-4, A-5	0	0-13	85-100	70-100	60-100	38-73	22-44	4-14
	23-48	Channery sandy loam, loam, fine sandy loam	SC, SC-SM, CL	A-4, A-6	0	0-12	86-100	72-100	61-100	36-70	21-34	5-14
	48-86	Channery sandy loam, loam, very channery fine sandy loam	GC, GC-GM, CL	A-4, A-2-4, A-1-b	0	2-38	70-97	41-96	32-96	15-53	16-28	2-12
	86-96	Bedrock	---		---	---	---	---	---	---	---	---
Fenwick---------	0-3	Moderately decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	3-8	Silt loam	MH, ML, CL-ML, SM	A-7-5, A-4	0	0-13	85-100	64-100	54-100	45-88	29-80	6-17
	8-23	Silt loam, loam	CL-ML, ML, SM	A-4	0	0-13	85-100	65-100	54-100	45-86	20-35	2-10
	23-66	Loam, silt loam, clay loam	CL, CL-ML, ML, SC	A-6, A-4	0	0-10	88-100	68-100	58-100	45-81	30-46	13-24
	66-86	Loam, silt loam, clay loam	CL, SC, CL-ML, ML	A-2-4, A-6, A-4	0	0-13	74-100	45-100	38-100	28-80	28-46	12-24
	86-99	Loam, silt loam, channery loam, channery sandy loam	CL, SC, CL-ML, ML	A-4, A-6, A-2-4	0	0-12	75-100	47-100	39-98	27-72	25-35	4-12
	99-109	Bedrock	---	---	---	---	---	---	---	---	---	---
PhA:												
Philo, occasionally flooded--------	0-5	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	5-23	Loam	CL, ML, CL-ML	A-4	0	0-5	95-100	80-100	75-90	60-80	20-35	1-10
	23-76	Silt loam, loam, sandy loam	ML, CL, CL-ML	A-4	0	0-4	95-100	73-100	53-100	35-74	20-35	1-10
	76-165	Sandy loam, stratified sand to silt loam, very gravelly sandy loam	ML, SM, CL-ML, GM	A-4, A-2-4	0	0-30	65-100	50-90	40-85	30-80	0-38	NP-19

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
PhA:												
Pope, occasionally flooded	0-3	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-5	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	5-18	Sandy loam	SC-SM, SM, CL-ML, ML	A-4, A-2	0	0	87-100	63-100	43-88	20-52	15-20	NP-5
	18-81	Fine sandy loam, sandy loam, loam	SM, CL-ML, ML, SC-SM	A-4, A-2	0	0	95-100	77-100	50-92	22-56	15-30	NP-7
	81-200	Very gravelly sandy loam, loamy sand	SM, SC-SM, GM	A-4, A-2, A-1	0	0-12	61-100	14-100	10-87	4-49	15-30	NP-7
PkC:												
Pipestem	0-1	Slightly decomposed plant material	PT	A-8	1-25	0	---	---	---	---	---	---
	1-11	Flaggy silt loam, silt loam, channery silty clay loam	MH, ML, CL	A-7-6, A-6	0-11	4-34	67-95	66-95	63-95	58-93	40-70	15-23
	11-137	Channery silt loam, silty clay, stony silty clay loam	CL, CH, GC	A-7-6, A-6	0-11	4-61	59-96	58-96	54-96	49-96	34-59	17-32
	137-200	Channery silt loam, very flaggy silty clay, very stony silty clay loam	CL, CH, GC	A-7-6, A-6	3-43	6-36	48-96	47-96	44-96	40-96	34-54	17-32
PmE:												
Pipestem	0-1	Slightly decomposed plant material	PT	A-8	25-43	0	---	---	---	---	---	---
	1-11	Flaggy silt loam, silt loam, channery silty clay loam	MH, ML, CL	A-7-6, A-6	0-11	4-34	67-95	66-95	63-95	58-93	40-70	15-23
	11-137	Channery silt loam, silty clay, stony silty clay loam	CL, CH, GC	A-7-6, A-6	0-34	4-38	59-96	58-96	54-96	49-96	34-59	17-32
	137-200	Channery silt loam, very flaggy silty clay, very stony silty clay loam	CL, CH, GC	A-7-6, A-6	3-43	6-36	48-96	47-96	44-96	40-96	34-54	17-32

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
PxA:												
Potomac, frequently flooded	0-2	Slightly decomposed plant material	PT	A-8	25-43	26-60	---	---	---	---	---	---
	2-20	Gravelly sandy loam	SM, GM	A-2-4, A-2-5, A-5	0	6-27	49-93	45-93	30-77	14-43	0-41	NP-9
	20-200	Stratified very gravelly sand to very gravelly loamy sand, extremely gravelly sandy loam, very gravelly loamy sand, extremely gravelly sand	GM, GW-GM	A-1	0	7-43	47-78	8-78	6-72	2-31	15-15	NP-3
Nelse, frequently flooded	0-30	Fine sandy loam, loam, sandy loam	CL, CL-ML, ML	A-4	3-12	0-7	78-100	76-100	55-84	34-56	33-53	9-18
	30-74	Loamy sand, gravelly loamy sand, loamy fine sand	SM, SC-SM	A-2-4	0	0-19	95-100	69-100	52-83	17-33	0-26	NP-6
	74-200	Sand, stratified sand to loamy fine sand, very cobbly sand	SM, SC-SM	A-2-4	0	0-25	77-100	53-100	40-84	6-19	0-26	NP-6
Qs. Quarry, sandstone												
Rw. Riverwash, frequently flooded												

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
UgC:												
Udorthents, graded	0-4	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	4-27	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	27-165	Gravelly sandy loam, very gravelly clay loam, extremely channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
UgF:												
Udorthents, graded	0-4	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	4-27	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	27-165	Gravelly sandy loam, very gravelly clay loam, extremely channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
Ur.												
Udorthents, railroad grade												

Table 19.—Engineering Properties—Continued

Map unit symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >250 mm	Fragments: 75-250 mm	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	Cm				Pct	Pct					Pct	
Uu:												
Udorthents, highways-------	0-4	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	4-27	Gravelly sandy loam, very gravelly clay loam, very channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
	27-165	Gravelly sandy loam, very gravelly clay loam, extremely channery silt loam, extremely channery loam	---	---	---	---	---	---	---	---	---	---
Urban land, highways.												
W.												
Water												

Table 20.—Physical Soil Properties

(Absence of an entry indicates that data were not estimated. Soil properties are measured or inferred from direct observations in the field or laboratory)

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
AtA:									
Atkins, frequently flooded	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-13	23-52	23-50	8-27	1.20-1.40	4.0-14.0	0.14-0.22	0.0-2.9	2.0-24
	13-20	23-52	23-50	8-27	1.20-1.40	4.0-14.0	0.14-0.22	0.0-2.9	2.0-8.0
	20-66	10-60	20-70	10-40	1.20-1.50	0.4-14.0	0.14-0.18	0.0-2.9	0.2-2.5
	66-97	10-60	20-70	10-40	1.20-1.50	0.1-14.0	0.14-0.18	0.0-2.9	0.2-2.5
	97-165	10-60	20-70	10-35	1.20-1.50	0.1-42.0	0.08-0.18	0.0-2.9	0.2-2.5
CaC:									
Cateache	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-9	3-28	50-70	18-35	1.04-1.36	4.0-14.0	0.14-0.18	1.7-2.8	3.0-11
	9-75	5-20	48-65	25-35	1.22-1.69	4.0-14.0	0.12-0.16	1.1-1.7	0.6-1.4
	75-92	7-22	35-62	25-45	1.45-1.68	0.4-4.0	0.10-0.14	1.3-3.2	0.3-0.6
	92-102	---	---	---	---	0.4-14.1	---	---	---
CbD:									
Cateache	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-9	3-28	50-70	18-35	1.04-1.36	4.0-14.0	0.14-0.18	1.7-2.8	3.0-11
	9-75	5-20	48-65	25-35	1.22-1.69	4.0-14.0	0.12-0.16	1.1-1.7	0.6-1.4
	75-92	7-22	35-62	25-45	1.45-1.68	0.4-4.0	0.10-0.14	1.3-3.2	0.3-0.6
	92-102				---	0.4-14.1	---	---	---
CbE:									
Cateache	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-9	3-28	50-70	18-35	1.04-1.36	4.0-14.0	0.14-0.18	1.7-2.8	3.0-11
	9-75	5-20	48-65	25-35	1.22-1.69	4.0-14.0	0.12-0.16	1.1-1.7	0.6-1.4
	75-92	7-22	35-62	25-45	1.45-1.68	0.4-4.0	0.10-0.14	1.3-3.2	0.3-0.6
	92-102	---	---	---	---	0.4-14.1	---	---	---
CcG:									
Cateache	0-8	3-28	50-70	18-35	1.04-1.36	4.0-14.0	0.14-0.18	1.7-2.8	3.0-11
	8-74	5-20	48-65	25-35	1.22-1.69	4.0-14.0	0.12-0.16	1.1-1.7	0.6-1.4
	74-91	7-22	35-62	25-45	1.45-1.68	0.4-4.0	0.10-0.14	1.3-3.2	0.3-0.6
	91-101	---	---	---	---	0.4-14.1	---	---	---
Pipestem	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-11	6-15	55-66	23-34	1.27-1.50	14.1-42.3	0.13-0.20	0.4-2.9	4.0-13
	11-137	6-14	41-66	25-45	1.27-1.86	4.2-14.1	0.12-0.18	1.0-4.5	0.2-3.2
	137-200	8-16	48-63	25-45	1.47-1.70	4.2-14.1	0.09-0.15	1.0-4.5	0.1-1.0
CfC:									
Cedarcreek, bench	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-10	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	10-25	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	25-165	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.04-0.16	0.0-2.9	0.0-0.1

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
CgF:									
Cedarcreek,									
outslope-------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-10	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	10-25	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	25-165	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.04-0.16	0.0-2.9	0.0-0.1
Cedarcreek,									
bench----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-10	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	10-25	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-0.5
	25-165	25-45	30-50	10-27	1.35-1.65	4.0-42.0	0.04-0.16	0.0-2.9	0.0-0.1
ChA:									
Chavies, rarely									
flooded--------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-28	35-80	10-35	2-15	1.20-1.40	14.0-42.0	0.11-0.18	0.0-2.9	3.0-6.0
	28-107	35-80	10-35	5-18	1.35-1.65	14.0-42.0	0.11-0.20	0.0-2.9	0.4-2.0
	107-165	35-85	10-35	2-18	1.30-1.50	14.0-42.0	0.08-0.18	0.0-2.9	0.3-1.0
ClE:									
Clifftop--------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-8	12-45	35-65	5-23	0.80-1.27	4.0-42.0	0.13-0.18	1.4-3.3	3.5-27
	8-20	10-42	35-65	14-23	1.11-1.56	4.0-42.0	0.11-0.18	0.4-3.0	0.4-4.3
	20-74	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	74-91	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	89-101	---	---	---	---	0.4-14.1	---	---	---
CnB:									
Clifftop--------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-8	12-45	35-65	5-23	0.80-1.27	4.0-42.0	0.13-0.18	1.4-3.3	3.5-27
	8-20	10-42	35-65	14-23	1.11-1.56	4.0-42.0	0.11-0.18	0.4-3.0	0.4-4.3
	20-74	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	74-91	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	91-101	---	---	---	---	0.4-14.1	---	---	---
Nallen----------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-4	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	4-13	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	13-23	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	23-48	29-65	24-49	9-21	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	48-86	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	86-96	---	---	---	---	0.4-14.1	---	---	---

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
CnC:									
Clifftop--------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-8	12-45	35-65	5-23	0.80-1.27	4.0-42.0	0.13-0.18	1.4-3.3	3.5-27
	8-20	10-42	35-65	14-23	1.11-1.56	4.0-42.0	0.11-0.18	0.4-3.0	0.4-4.3
	20-74	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	74-91	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	91-101	---	---	---	---	0.4-14.1	---	---	---
Nallen----------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-4	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	4-13	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	13-23	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	23-48	29-65	24-49	9-21	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	48-86	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	86-96	---	---	---	---	0.4-14.1	---	---	---
CnD:									
Clifftop--------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-8	12-45	35-65	5-23	0.80-1.27	4.0-42.0	0.13-0.18	1.4-3.3	3.5-27
	8-20	10-42	35-65	14-23	1.11-1.56	4.0-42.0	0.11-0.18	0.4-3.0	0.4-4.3
	20-74	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	74-91	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	91-101	---	---	---	---	0.4-14.1	---	---	---
Nallen----------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-4	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	4-13	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	13-23	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	23-48	29-65	24-49	9-21	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	48-86	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	86-96	---	---	---	---	0.4-14.1	---	---	---
CoA:									
Combs, occasionally flooded--------	0-25	45-70	20-52	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	3.0-7.0
	25-122	45-70	20-52	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	0.5-2.0
	122-200	50-80	15-40	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	0.5-2.0
CpA:									
Combs, occasionally flooded--------	0-25	45-70	20-52	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	3.0-7.0
	25-122	45-70	20-52	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	0.5-2.0
	122-200	50-80	15-40	5-18	1.20-1.50	4.2-42.3	0.12-0.20	0.0-2.9	0.5-2.0
Potomac, occasionally flooded--------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-20	55-85	0-50	0-15	1.20-1.40	4.0-42.0	0.08-0.12	0.5-1.4	2.0-7.0
	20-200	70-100	0-20	0-20	1.30-1.60	42.0-141.0	0.03-0.06	0.0-2.9	0.2-1.0

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
CrB:									
Cookport----------	0-3	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	3-8	10-70	21-74	3-27	0.80-1.20	14.0-42.0	0.12-0.16	0.2-2.4	1.0-15
	8-23	11-65	28-54	8-21	1.10-1.30	14.0-42.0	0.08-0.16	0.3-2.4	1.5-6.5
	23-56	11-65	18-66	8-33	1.20-1.50	4.0-14.0	0.12-0.16	0.6-1.5	0.6-1.2
	56-107	15-70	19-68	8-35	1.40-1.70	0.4-1.4	0.08-0.12	0.2-2.5	0.3-0.8
	107-124	16-75	13-37	7-26	1.40-1.70	0.4-1.4	0.08-0.12	0.2-2.5	0.2-0.8
	124-134	---	---	---	---	0.4-14.1	---	---	---
Nallen------------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-4	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	4-13	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	13-23	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	23-48	29-65	24-49	9-21	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	48-86	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	86-96	---	---	---	---	0.4-14.1	---	---	---
CtB:									
Cotaco------------	0-4	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	4-6	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	6-23	20-50	28-65	8-27	1.20-1.40	4.0-42.0	0.14-0.18	0.0-2.9	2.0-4.0
	23-30	20-50	28-65	8-27	1.20-1.40	4.0-42.0	0.14-0.18	0.0-2.9	0.6-0.8
	30-53	15-52	28-65	18-40	1.20-1.50	4.0-14.0	0.11-0.18	0.0-2.9	0.3-0.5
	53-93	15-52	28-65	18-38	1.40-1.70	4.0-14.0	0.11-0.18	0.0-2.9	0.2-0.4
	93-123	15-52	28-65	18-38	1.40-1.70	4.0-14.0	0.11-0.18	0.0-2.9	0.1-0.4
	123-200	15-52	28-65	18-40	1.45-1.70	4.0-14.0	0.09-0.18	0.0-2.9	0.1-0.3
CxA:									
Craigsville rarely flooded-	0-5	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	5-8	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	8-21	23-75	15-35	0-20	1.20-1.40	14.0-141.0	0.05-0.15	0.0-2.9	1.0-5.0
	21-60	30-75	15-35	0-20	1.30-1.60	14.0-141.0	0.05-0.15	0.0-2.9	0.3-2.0
	60-200	60-90	5-50	0-15	1.35-1.55	14.0-141.0	0.05-0.09	0.0-2.9	0.3-1.6
DkC:									
Dekalb------------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-3	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	3-8	35-70	22-45	3-14	0.80-1.20	42.0-141.0	0.15-0.45	2.0-2.2	8.0-20
	8-20	35-70	24-46	5-18	1.10-1.20	42.0-141.0	0.08-0.12	0.5-1.4	2.0-7.0
	20-65	35-70	24-46	5-20	1.20-1.50	42.0-141.0	0.06-0.12	0.4-1.8	1.0-2.5
	65-80	35-90	16-44	5-18	1.20-1.50	42.0-141.0	0.05-0.10	0.4-1.3	0.3-2.0
	80-90	---	---	---	---	1.4-141.1	---	---	---

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
DrE:									
Dekalb----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-3	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	3-8	35-70	22-45	3-14	0.80-1.20	42.0-141.0	0.15-0.45	2.0-2.2	8.0-20
	8-20	35-70	24-46	5-18	1.10-1.20	42.0-141.0	0.08-0.12	0.5-1.4	2.0-7.0
	20-65	35-70	24-46	5-20	1.20-1.50	42.0-141.0	0.06-0.12	0.4-1.8	1.0-2.5
	65-80	35-90	16-44	5-18	1.20-1.50	42.0-141.0	0.05-0.10	0.4-1.3	0.3-2.0
	80-90	---	---	---	---	1.4-141.1	---	---	---
GaB:									
Gilpin----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-2	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	2-16	12-45	35-65	5-23	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.5-4.0
	16-29	12-45	35-65	7-27	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.7-3.5
	29-70	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	70-76	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	76-96	---	---	---	---	0.0-14.0	---	---	---
GaC:									
Gilpin----------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-10	12-45	35-65	5-23	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.5-4.0
	10-32	12-45	35-65	7-27	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.7-3.5
	32-63	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	63-76	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	76-96	---	---	---	---	0.0-14.0	---	---	---
GaD:									
Gilpin----------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-8	12-45	35-65	5-23	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.5-4.0
	8-32	12-45	35-65	7-27	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.7-3.5
	32-63	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	63-76	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	76-96	---	---	---	---	0.0-14.0	---	---	---
GbE:									
Gilpin----------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-8	12-45	35-65	5-23	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.5-4.0
	8-32	12-45	35-65	7-27	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.7-3.5
	32-63	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	63-76	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	76-96	---	---	---	---	0.0-14.0	---	---	---
Berks-----------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-13	8-32	42-76	14-23	0.75-1.25	4.0-42.0	0.08-0.12	0.5-2.9	5.5-11
	13-24	11-43	42-72	14-23	1.00-1.30	4.0-42.0	0.08-0.12	0.5-2.1	1.5-5.0
	24-85	8-37	46-75	15-23	1.30-1.60	4.0-42.0	0.04-0.10	0.2-1.6	0.5-2.2
	85-94	5-30	46-75	17-26	1.30-1.70	14.0-42.0	0.04-0.10	0.2-1.2	0.2-1.2
	94-104	---	---	---	---	1.4-141.1	---	---	---

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
GhG:									
Gilpin----------	0-5	12-45	35-65	5-23	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.5-4.0
	5-22	12-45	35-65	7-27	1.20-1.40	4.0-14.0	0.13-0.18	1.4-3.3	0.7-3.5
	22-53	5-40	35-65	20-35	1.19-1.59	4.0-14.0	0.11-0.18	0.5-3.0	0.3-1.7
	53-66	5-30	35-65	20-42	1.39-1.65	2.8-14.0	0.08-0.13	0.7-3.0	0.3-0.8
	66-86	---	---	---	---	0.0-14.0	---	---	---
Highsplint------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-18	22-53	35-53	14-27	1.04-1.12	14.1-141.1	0.09-0.16	1.3-2.7	3.9-9.5
	18-27	21-51	37-55	14-27	1.10-1.49	14.1-42.3	0.09-0.16	0.5-2.1	1.5-3.0
	27-108	22-53	36-55	14-30	1.25-1.68	4.2-14.1	0.08-0.12	0.2-2.2	0.3-1.7
	108-135	28-55	34-53	7-27	1.25-1.70	4.2-14.1	0.07-0.12	0.3-1.3	0.3-0.9
	135-165	27-61	23-54	14-27	1.37-1.80	4.2-14.1	0.04-0.11	0.3-1.3	0.2-1.0
Berks-----------	0-5	8-32	42-76	14-23	0.75-1.25	4.0-42.0	0.08-0.12	0.5-2.9	5.5-11
	5-16	11-43	42-72	14-23	1.00-1.30	4.0-42.0	0.08-0.12	0.5-2.1	1.5-5.0
	16-77	8-37	46-75	15-23	1.30-1.60	4.0-42.0	0.04-0.10	0.2-1.6	0.5-2.2
	77-86	5-30	46-75	17-26	1.30-1.70	14.0-42.0	0.04-0.10	0.2-1.2	0.2-1.2
	86-96	---	---	---	---	1.4-141.1	---	---	---
HgE:									
Highsplint------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-18	22-53	35-53	14-27	1.04-1.12	14.1-141.1	0.09-0.16	1.3-2.7	3.9-9.5
	18-27	21-51	37-55	14-27	1.10-1.49	14.1-42.3	0.09-0.16	0.5-2.1	1.5-3.0
	27-108	22-53	36-55	14-30	1.25-1.68	4.2-14.1	0.08-0.12	0.2-2.2	0.3-1.7
	108-135	28-55	34-53	14-27	1.25-1.70	4.2-14.1	0.07-0.12	0.3-1.3	0.3-0.9
	135-165	27-61	23-54	14-27	1.37-1.80	4.2-14.1	0.04-0.11	0.3-1.3	0.2-1.0
ImC:									
Itmann----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-9	43-85	0-50	7-15	1.00-1.30	14.0-141.0	0.05-0.12	0.0-2.9	0.5-0.5
	9-165	40-75	15-48	4-15	1.00-1.30	14.0-141.0	0.05-0.12	0.0-2.9	0.0-0.1
ImF:									
Itmann----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-9	43-85	0-50	7-15	1.00-1.30	14.0-141.0	0.05-0.12	0.0-2.9	0.5-0.5
	9-165	40-75	15-48	4-15	1.00-1.30	14.0-141.0	0.05-0.12	0.0-2.9	0.0-0.1
KmC:									
Kaymine, bench--	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-33	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-3.0
	33-165	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.2-0.4
KrF:									
Kaymine, outslope-------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-33	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-3.0
	33-165	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.2-0.4

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
KrF:									
Kaymine, bench--	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-33	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.5-3.0
	33-165	23-52	28-50	18-27	1.35-1.65	4.0-42.0	0.07-0.16	0.0-2.9	0.2-0.4
KwA:									
Knowlton, rarely flooded--------	0-2	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	2-25	20-50	28-65	8-27	1.20-1.40	4.0-42.0	0.14-0.18	0.0-2.9	4.0-8.0
	25-43	20-50	28-65	8-27	1.20-1.40	4.0-42.0	0.14-0.18	0.0-2.9	0.6-0.8
	43-56	15-52	28-65	7-27	1.20-1.50	4.0-14.0	0.11-0.18	0.0-2.9	0.3-0.5
	56-165	15-52	28-65	7-38	1.40-1.70	4.0-14.0	0.11-0.18	0.0-2.9	0.2-0.4
LaC:									
Laidig----------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-9	23-50	34-59	1-21	0.80-1.20	14.0-42.0	0.15-0.45	0.2-1.0	4.4-18
	9-19	24-51	34-57	12-26	1.10-1.35	14.0-42.0	0.12-0.22	0.2-1.5	2.0-4.4
	19-80	20-51	36-56	12-27	1.35-1.60	4.2-14.0	0.09-0.17	0.2-2.0	0.3-0.8
	80-122	24-52	31-52	15-35	1.35-1.65	4.2-14.0	0.09-0.17	0.6-1.7	0.2-0.7
	122-200	24-63	25-50	11-31	1.55-1.80	0.4-1.4	0.03-0.12	0.3-1.4	0.2-0.3
LeF:									
Layland---------	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-15	28-43	36-54	16-20	1.04-1.07	14.1-42.3	0.08-0.18	1.9-2.7	7.0-22
	15-23	26-44	35-55	17-21	1.19-1.33	4.2-14.1	0.08-0.18	1.4-2.1	2.0-4.5
	23-117	23-45	34-53	18-26	1.43-1.66	4.2-14.1	0.08-0.18	0.4-2.1	0.2-1.6
	117-145	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.2-0.6
	145-200	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.1-0.5
Dekalb----------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-3	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	3-8	35-70	22-45	3-14	0.80-1.20	42.0-141.0	0.15-0.45	2.0-2.2	8.0-20
	8-20	35-70	24-46	5-18	1.10-1.20	42.0-141.0	0.08-0.12	0.5-1.4	2.0-7.0
	20-65	35-70	24-46	5-20	1.20-1.50	42.0-141.0	0.06-0.12	0.4-1.8	1.0-2.5
	65-80	35-90	16-44	5-18	1.20-1.50	42.0-141.0	0.05-0.10	0.4-1.3	0.3-2.0
	80-90	---	---	---	---	1.4-141.1	---	---	---
Guyandotte------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-31	32-78	13-53	10-19	0.77-1.19	4.0-42.0	0.10-0.16	1.8-3.9	2.6-15
	31-46	32-72	17-53	11-25	1.26-1.41	4.0-42.0	0.09-0.16	0.4-2.0	1.2-2.4
	46-140	17-62	27-53	10-26	1.32-1.69	4.0-42.0	0.05-0.13	0.1-1.8	0.4-2.0
	140-200	27-64	24-54	11-26	1.53-1.69	4.0-42.0	0.05-0.12	0.1-1.8	0.3-1.3

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
LgG:									
Layland	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-15	28-43	36-54	16-20	1.04-1.07	14.1-42.3	0.08-0.18	1.9-2.7	7.0-22
	15-23	26-44	35-55	17-21	1.19-1.33	4.2-14.1	0.08-0.18	1.4-2.1	2.0-4.5
	23-117	23-45	34-53	18-26	1.43-1.66	4.2-14.1	0.08-0.18	0.4-2.1	0.2-1.6
	117-145	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.2-0.6
	145-200	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.1-0.5
Dekalb	0-5	35-70	22-45	3-14	0.80-1.20	42.0-141.0	0.15-0.45	2.0-2.2	8.0-20
	5-17	35-70	24-46	5-18	1.10-1.20	42.0-141.0	0.08-0.12	0.5-1.4	2.0-7.0
	17-62	35-70	24-46	5-20	1.20-1.50	42.0-141.0	0.06-0.12	0.4-1.8	1.0-2.5
	62-77	35-90	16-44	5-18	1.20-1.50	42.0-141.0	0.05-0.10	0.4-1.3	0.3-2.0
	77-87	---	---	---	---	1.4-141.1	---	---	---
LhE:									
Layland	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-15	28-43	36-54	16-20	1.04-1.07	14.1-42.3	0.08-0.18	1.9-2.7	7.0-22
	15-23	26-44	35-55	17-21	1.19-1.33	4.2-14.1	0.08-0.18	1.4-2.1	2.0-4.5
	23-117	23-45	34-53	18-26	1.43-1.66	4.2-14.1	0.08-0.18	0.4-2.1	0.2-1.6
	117-145	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.2-0.6
	145-200	10-43	39-61	17-29	1.31-1.68	4.2-14.1	0.06-0.13	0.5-1.3	0.1-0.5
Laidig	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-9	23-50	34-59	1-21	0.80-1.20	14.0-42.0	0.15-0.45	0.2-1.0	4.4-18
	9-19	24-51	34-57	12-26	1.10-1.35	14.0-42.0	0.12-0.22	0.2-1.5	2.0-4.4
	19-80	20-51	36-56	12-27	1.35-1.60	4.2-14.0	0.09-0.17	0.2-2.0	0.3-0.8
	80-122	24-52	31-52	15-35	1.35-1.65	4.2-14.0	0.09-0.17	0.6-1.7	0.2-0.7
	122-200	24-63	25-50	11-31	1.55-1.80	0.4-1.4	0.03-0.12	0.3-1.4	0.2-0.3
LlB:									
Lily	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-11	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	11-19	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	19-78	29-65	24-49	16-27	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	78-90	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	90-100				---	0.4-14.1	---	---	---
LlC:									
Lily	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-11	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	11-19	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	19-78	29-65	24-49	16-27	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	78-90	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	90-100	---	---	---	---	0.4-14.1	---	---	---

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
LrA:									
Lithic Hapludolls, rarely flooded	0-20	23-75	15-49	4-18	1.20-1.40	4.2-42.3	0.06-0.15	0.0-2.9	4.0-12
	20-38	23-75	15-49	4-18	1.20-1.40	4.2-42.3	0.06-0.14	0.0-2.9	3.0-9.0
	38-46	23-75	15-49	4-18	1.20-1.40	4.2-42.3	0.05-0.11	0.0-2.9	1.0-5.0
	46-56	---	---	---	---	0.0-0.2	---	---	---
LxG:									
Lithic Udorthents, cut land	0-10	20-70	10-79	0-35	---	---	0.04-0.10	---	0.0-0.5
	10-22	0-70	10-79	0-35	---	---	0.04-0.10	---	0.0-0.1
	22-32	---	---	---	---	0.0-10.0	---	---	---
NfC:									
Nallen	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-4	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	4-13	30-68	24-54	9-18	0.80-1.20	4.0-42.0	0.14-0.17	2.0-2.2	4.0-12
	13-23	28-64	28-54	8-21	1.20-1.30	14.0-42.0	0.09-0.17	0.2-1.1	1.5-6.5
	23-48	29-65	24-49	9-21	1.26-1.56	14.0-42.0	0.09-0.17	0.4-2.4	0.5-1.2
	48-86	31-70	19-35	5-18	1.40-1.70	14.0-42.0	0.06-0.16	0.4-1.1	0.2-0.3
	86-96	---	---	---	---	0.4-14.1	---	---	---
Fenwick	0-3	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	3-8	14-50	35-60	10-27	0.80-1.27	4.0-42.0	0.13-0.18	1.4-3.3	3.5-21
	8-23	14-50	35-60	10-27	1.01-1.21	4.0-42.0	0.12-0.16	0.4-3.0	3.0-6.0
	23-66	10-52	28-60	20-35	1.25-1.60	4.0-14.0	0.10-0.16	1.2-2.9	0.2-1.5
	66-86	10-52	28-60	18-35	1.25-1.60	1.4-4.0	0.10-0.16	1.2-2.9	0.2-1.5
	86-99	10-60	28-60	15-30	1.40-1.70	1.4-4.0	0.08-0.14	1.0-2.9	0.1-0.3
	99-109	---	---	---	---	0.0-4.2	---	---	---
PhA:									
Philo, occasionally flooded	0-5	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	5-23	23-52	28-50	7-27	1.20-1.40	4.0-14.0	0.14-0.20	0.0-2.9	2.0-4.0
	23-76	0-85	0-83	0-27	1.40-1.70	4.0-14.0	0.10-0.20	0.0-2.9	0.0-0.5
	76-165	0-90	0-83	0-27	1.40-1.75	14.0-42.0	0.06-0.10	0.0-2.9	0.0-0.5
Pope, occasionally flooded	0-3	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	3-5	16-52	0	0	0.10-0.20	42.0-141.0	0.03-0.08	---	48-84
	5-18	43-85	0-50	0-20	1.20-1.40	14.0-42.0	0.10-0.16	0.0-2.9	1.0-4.0
	18-81	23-85	0-50	0-27	1.30-1.60	4.0-42.0	0.10-0.18	0.0-2.9	0.3-2.0
	81-200	43-90	0-50	0-20	1.30-1.60	4.0-42.0	0.10-0.18	0.0-2.9	0.3-1.6

Table 20.—Physical Soil Properties—Continued

Map unit symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Shrink-swell potential	Organic matter
	Cm	Pct	Pct	Pct	g/cc	um/sec	Cm/cm	Pct	Pct
PkC:									
Pipestem--------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-11	6-15	55-66	23-34	1.27-1.50	14.1-42.3	0.13-0.20	0.4-2.9	4.0-13
	11-137	6-14	41-66	25-45	1.27-1.86	4.2-14.1	0.12-0.18	1.0-4.5	0.2-3.2
	137-200	8-16	48-63	25-45	1.47-1.70	4.2-14.1	0.09-0.15	1.0-4.5	0.1-1.0
PmE:									
Pipestem--------	0-1	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	1-11	6-15	55-66	23-34	1.27-1.50	14.1-42.3	0.13-0.20	0.4-2.9	4.0-13
	11-137	6-14	41-66	25-45	1.27-1.86	4.2-14.1	0.12-0.18	1.0-4.5	0.2-3.2
	137-200	8-16	48-63	25-45	1.47-1.70	4.2-14.1	0.09-0.15	1.0-4.5	0.1-1.0
PxA:									
Potomac, frequently flooded--------	0-2	14-48	0	0	0.05-0.20	42.0-141.0	0.00-0.03	---	52-86
	2-20	55-85	0-50	0-15	1.20-1.40	4.0-42.0	0.08-0.12	0.5-1.4	2.0-7.0
	20-200	70-100	0-20	0-20	1.30-1.60	42.0-141.0	0.03-0.06	0.0-2.9	0.2-1.0
Nelse, frequently flooded--------	0-30	35-65	15-40	8-20	1.20-1.40	4.0-14.0	0.12-0.22	0.0-2.9	4.0-8.0
	30-74	60-90	5-38	2-10	1.40-1.70	14.0-141.0	0.05-0.10	0.0-2.9	0.5-2.0
	74-200	80-95	0-18	2-10	1.40-1.70	14.0-141.0	0.05-0.10	0.0-2.9	0.5-2.0
UgC:									
Udorthents, graded---------	0-4	---	---	0-35	---	---	---	---	0.0-0.5
	4-27	---	---	0-35	---	---	---	---	0.0-0.5
	27-165	---	---	0-35	---	---	---	---	0.0-0.1
UgF:									
Udorthents, graded---------	0-4	---	---	0-35	---	---	---	---	0.0-0.5
	4-27	---	---	0-35	---	---	---	---	0.0-0.5
	27-165	---	---	0-35	1.20-1.65	---	---	---	0.0-0.1
Ur. Udorthents railroad grade									
Uu:									
Udorthents, highways-------	0-4	0-70	10-79	0-35	---	---	---	---	0.0-0.5
	4-27	0-70	10-79	0-35	---	---	---	---	0.0-0.5
	27-165	0-70	10-79	0-35	---	---	---	---	0.0-0.1

Table 21.—Erosion Properties

(Entries under "Erosion factors" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map unit symbol and soil name	Depth (centimeters)	Erosion factors: Kw	Erosion factors: Kf	Erosion factors: T	Wind erodi-bility group	Wind erodi-bility index
AtA:						
Atkins, frequently flooded	0-3	---	---	5	6	48
	3-5	---	---			
	5-13	.24	.24			
	13-20	.24	.24			
	20-66	.37	.37			
	66-97	.43	.43			
	97-165	.32	.32			
CaC:						
Cateache	0-2	---	---	3	7	38
	2-9	.20	.37			
	9-75	.20	.37			
	75-92	.20	.37			
	92-102	---	---			
CbD:						
Cateache	0-2	---	---	3	7	38
	2-9	.20	.37			
	9-75	.20	.37			
	75-92	.20	.37			
	92-102	---	---			
CbE:						
Cateache	0-1	---	---	3	7	38
	1-9	.20	.37			
	9-75	.20	.37			
	75-92	.20	.37			
	92-102	---	---			
CcG:						
Cateache	0-8	.20	.37	3	7	38
	8-74	.20	.37			
	74-91	.20	.37			
	91-101	---	---			
Pipestem	0-1	---	---	5	7	38
	1-11	.28	.28			
	11-137	.20	.37			
	137-200	.17	.43			
CfC:						
Cedarcreek, bench	0-1	---	---	5	8	0
	1-10	.15	.37			
	10-25	.15	.37			
	25-165	.10	.37			
CgF:						
Cedarcreek, outslope	0-1	---	---	5	8	0
	1-10	.15	.37			
	10-25	.15	.37			
	25-165	.10	.37			
Cedarcreek, bench	0-1	---	---	5	8	0
	1-10	.15	.37			
	10-25	.15	.37			
	25-165	.10	.37			
Rock outcrop, highwall.						

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
ChA:						
Chavies, rarely flooded	0-2	---	---	5	3	86
	2-28	.24	.24			
	28-107	.28	.28			
	107-165	.17	.17			
ClE:						
Clifftop	0-3	---	---	3	6	48
	3-8	.20	.32			
	8-20	.37	.37			
	20-74	.24	.37			
	74-91	.10	.37			
	89-101	---	---			
CnB:						
Clifftop	0-3	---	---	3	6	48
	3-8	.20	.32			
	8-20	.37	.37			
	20-74	.24	.37			
	74-91	.10	.37			
	91-101	---	---			
Nallen	0-3	---	---	2	5	56
	3-4	---	---			
	4-13	.24	.24			
	13-23	.32	.32			
	23-48	.37	.37			
	48-86	.24	.32			
	86-96	---	---			
CnC:						
Clifftop	0-3	---	---	3	6	48
	3-8	.20	.32			
	8-20	.37	.37			
	20-74	.24	.37			
	74-91	.10	.37			
	91-101	---	---			
Nallen	0-3	---	---	2	5	56
	3-4	---	---			
	4-13	.24	.24			
	13-23	.32	.32			
	23-48	.37	.37			
	48-86	.24	.32			
	86-96	---	---			
CnD:						
Clifftop	0-3	---	---	3	6	48
	3-8	.20	.32			
	8-20	.37	.37			
	20-74	.24	.37			
	74-91	.10	.37			
	91-101	---	---			
Nallen	0-3	---	---	2	5	56
	3-4	---	---			
	4-13	.24	.24			
	13-23	.32	.32			
	23-48	.37	.37			
	48-86	.24	.32			
	86-96	---	---			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
CoA:						
Combs, occasionally flooded----	0-25	.20	.20	5	3	86
	25-122	.28	.28			
	122-200	.15	.24			
CpA:						
Combs, occasionally flooded----	0-25	.20	.20	5	3	86
	25-122	.28	.28			
	122-200	.15	.24			
Potomac, occasionally flooded--	0-2	---	---	5	5	56
	2-20	.10	.15			
	20-200	.02	.10			
CrB:						
Cookport-----------------------	0-3	---	---	3	5	56
	3-8	.28	.28			
	8-23	.37	.37			
	23-56	.43	.43			
	56-107	.43	.43			
	107-124	.32	.32			
	124-134	---	---			
Nallen-------------------------	0-3	---	---	2	5	56
	3-4	---	---			
	4-13	.24	.24			
	13-23	.32	.32			
	23-48	.37	.37			
	48-86	.24	.32			
	86-96	---	---			
CtB:						
Cotaco-------------------------	0-4	---	---	5	5	56
	4-6	---	---			
	6-23	.28	.28			
	23-30	.37	.37			
	30-53	.37	.37			
	53-93	.37	.37			
	93-123	.32	.32			
	123-200	.32	.32			
CxA:						
Craigsville, rarely flooded----	0-5	---	---	3	6	48
	5-8	---	---			
	8-21	.05	.17			
	21-60	.05	.24			
	60-200	.02	.05			
DkC:						
Dekalb-------------------------	0-1	---	---	2	6	48
	1-3	---	---			
	3-8	.05	.20			
	8-20	.10	.24			
	20-65	.10	.32			
	65-80	.10	.37			
	80-90	---	---			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
DrE:						
Dekalb	0-1	---	---	2	6	48
	1-3	---	---			
	3-8	.05	.20			
	8-20	.10	.24			
	20-65	.10	.32			
	65-80	.10	.37			
	80-90	---	---			
Rock outcrop.						
GaB:						
Gilpin	0-1	---	---	3	5	56
	1-2	---	---			
	2-16	.37	.37			
	16-29	.24	.37			
	29-70	.28	.43			
	70-76	.10	.43			
	76-96	---	---			
GaC:						
Gilpin	0-2	---	---	3	5	56
	2-10	.37	.37			
	10-32	.24	.37			
	32-63	.28	.43			
	63-76	.10	.43			
	76-96	---	---			
GaD:						
Gilpin	0-2	---	---	3	5	56
	2-8	.37	.37			
	8-32	.24	.37			
	32-63	.28	.43			
	63-76	.10	.43			
	76-96	---	---			
GbE:						
Gilpin	0-3	---	---	3	5	56
	3-8	.37	.37			
	8-32	.24	.37			
	32-63	.28	.43			
	63-76	.10	.43			
	76-96	---	---			
Berks	0-3	---	---	2	7	38
	3-13	.15	.28			
	13-24	.17	.37			
	24-85	.17	.24			
	85-94	.10	.49			
	94-104	---	---			
GhG:						
Gilpin	0-5	.37	.37	3	5	56
	5-22	.24	.37			
	22-53	.28	.43			
	53-66	.10	.43			
	66-86	---	---			
Highsplint	0-1	---	---	4	6	48
	1-18	.10	.24			
	18-27	.15	.32			
	27-108	.15	.43			
	108-135	.10	.43			
	135-165	.10	.37			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
GhG:						
Berks	0-5	.15	.28	2	7	38
	5-16	.17	.37			
	16-77	.17	.43			
	77-86	.10	.49			
	86-96	---	---			
HgE:						
Highsplint	0-3	---	---	4	6	48
	3-18	.10	.24			
	18-27	.15	.32			
	27-108	.15	.43			
	108-135	.10	.43			
	135-165	.10	.37			
ImC:						
Itmann	0-1	---	---	5	6	48
	1-9	.10	.20			
	9-165	.05	.28			
ImF:						
Itmann	0-1	---	---	5	6	48
	1-9	.10	.20			
	9-165	.05	.28			
KmC:						
Kaymine, bench	0-1	---	---	5	8	0
	1-33	.05	.24			
	33-165	.05	.37			
KrF:						
Kaymine, outslope	0-1	---	---	5	8	0
	1-33	.05	.24			
	33-165	.05	.37			
Kaymine, bench	0-1	---	---	5	8	0
	1-33	.05	.24			
	33-165	.05	.37			
Rock outcrop, highwall.						
KwA:						
Knowlton, rarely flooded	0-2	---	---	5	5	56
	2-25	.24	.24			
	25-43	.49	.49			
	43-56	.43	.43			
	56-165	.43	.43			
LaC:						
Laidig	0-2	---	---	4	6	48
	2-9	.15	.28			
	9-19	.20	.28			
	19-80	.24	.37			
	80-122	.24	.43			
	122-200	.20	.43			
LeF:						
Layland	0-3	---	---	4	6	48
	3-5	---	---			
	5-15	.15	.28			
	15-23	.20	.37			
	23-117	.15	.37			
	117-145	.10	.43			
	145-200	.10	.43			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
LeF:						
Dekalb-------------------------	0-1	---	---	2	6	48
	1-3	---	---			
	3-8	.05	.20			
	8-20	.10	.24			
	20-65	.10	.32			
	65-80	.10	.37			
	80-90	---	---			
Guyandotte---------------------	0-2	---	---	5	7	38
	2-31	.05	.15			
	31-46	.10	.24			
	46-140	.05	.28			
	140-200	.05	.32			
LgG:						
Layland------------------------	0-3	---	---	4	6	48
	3-5	---	---			
	5-15	.15	.28			
	15-23	.20	.37			
	23-117	.15	.37			
	117-145	.10	.43			
	145-200	.10	.43			
Dekalb-------------------------	0-5	.05	.20	2	6	48
	5-17	.10	.24			
	17-62	.10	.32			
	62-77	.10	.37			
	77-87	---	---			
Rock outcrop.						
LhE:						
Layland------------------------	0-3	---	---	4	6	48
	3-5	---	---			
	5-15	.15	.28			
	15-23	.20	.37			
	23-117	.15	.37			
	117-145	.10	.43			
	145-200	.10	.43			
Laidig-------------------------	0-2	---	---	4	6	48
	2-9	.15	.28			
	9-19	.20	.28			
	19-80	.24	.37			
	80-122	.24	.43			
	122-200	.20	.43			
LlB:						
Lily---------------------------	0-2	---	---	2	5	56
	2-5	---	---			
	5-11	.24	.24			
	11-19	.32	.32			
	19-78	.32	.32			
	78-90	.24	.32			
	90-100	---	---			
LlC:						
Lily---------------------------	0-2	---	---	2	5	56
	2-5	---	---			
	5-11	.24	.24			
	11-19	.32	.32			
	19-78	.32	.32			
	78-90	.24	.32			
	90-100	---	---			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
LrA:						
Lithic Hapludolls, rarely flooded	0-20	.15	.37	1	7	38
	20-38	.10	.43			
	38-46	.10	.43			
	46-56	---	---			
Rock outcrop.						
LxG:						
Lithic Udorthents, cut land	0-10	---	---	1	---	---
	10-22	---	---			
	22-32	---	---			
Rock outcrop.						
NfC:						
Nallen	0-3	---	---	2	5	56
	3-4	---	---			
	4-13	.24	.24			
	13-23	.32	.32			
	23-48	.37	.37			
	48-86	.24	.32			
	86-96	---	---			
Fenwick	0-3	---	---	2	5	56
	3-8	.37	.37			
	8-23	.32	.32			
	23-66	.37	.37			
	66-86	.43	.43			
	86-99	.43	.43			
	99-109	---	---			
PhA:						
Philo, occasionally flooded	0-5	---	---	4	6	48
	5-23	.32	.32			
	23-76	.43	.43			
	76-165	.10	.28			
Pope, occasionally flooded	0-3	---	---	4	3	86
	3-5	---	---			
	5-18	.17	.17			
	18-81	.24	.24			
	81-200	.05	.15			
PkC:						
Pipestem	0-1	---	---	5	6	48
	1-11	.28	.28			
	11-137	.20	.37			
	137-200	.17	.43			
PmE:						
Pipestem	0-1	---	---	5	7	38
	1-11	.28	.28			
	11-137	.20	.37			
	137-200	.17	.43			
PxA:						
Potomac, frequently flooded	0-2	---	---	5	5	56
	2-20	.10	.15			
	20-200	.02	.10			
Nelse, frequently flooded	0-30	.20	.20	2	3	86
	30-74	.20	.20			
	74-200	.02	.02			

Table 21.—Erosion Properties—Continued

Map unit symbol and soil name	Depth (centimeters)	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
		Kw	Kf	T		
Qs.						
Quarry, sandstone						
Rw.						
Riverwash, frequently flooded						
UgC:						
Udorthents, graded	0-4	---	---	3	---	---
	4-27	---	---			
	27-165	---	---			
UgF:						
Udorthents, graded	0-4	---	---	3	---	---
	4-27	---	---			
	27-165	---	---			
Ur.						
Udorthents, railroad grade						
Uu:						
Udorthents, highways	0-4	---	---	3	---	---
	4-27	---	---			
	27-165	---	---			
Urban land, highways.						
W.						
Water						

Table 22.—Total Soil Carbon

(This table displays soil organic carbon (SOC) and soil inorganic carbon (SIC) in kilograms per square meter to a depth of 2 meters or to the representative top depth of any kind of bedrock or any cemented soil horizon. SOC and SIC are reported on a volumetric whole soil basis, corrected for representative rock fragments indicated in the database. SOC is converted from horizon soil organic matter of the fraction of the soil less than 2 mm in diameter. If soil organic matter indicated in the database is NULL, SOC is assumed to be zero. SIC is converted from horizon calcium carbonate content fraction of the soil less than 2 mm in diameter. If horizon calcium carbonate indicated in the database is NULL, SIC is assumed to be zero. A weighted average of all horizons is used in the calculations. Only major components of a map unit are displayed in this table)

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m^2	kg/m^2
AtA:		
Atkins, frequently flooded (75%)	25	0
CaC:		
Cateache (75%)	9	0
CbD:		
Cateache (75%)	9	0
CbE:		
Cateache (75%)	9	0
CcG:		
Cateache (40%)	10	0
Pipestem (40%)	19	0
CfC:		
Cedarcreek, bench (75%)	1	0
CgF:		
Cedarcreek, outslope (40%)	1	0
Cedarcreek, bench (35%)	1	0
Rock outcrop, highwall (15%)	0	0
ChA:		
Chavies, rarely flooded (75%)	19	0
ClE:		
Clifftop (70%)	9	0
CnB:		
Clifftop (55%)	9	0
Nallen (30%)	10	0
CnC:		
Clifftop (50%)	8	0
Nallen (35%)	10	0

Table 22.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m^2	kg/m^2
CnD:		
Clifftop (55%)	8	0
Nallen (25%)	10	0
CoA:		
Combs, occasionally flooded (85%)	24	0
CpA:		
Combs, occasionally flooded (45%)	24	0
Potomac, occasionally flooded (35%)	15	0
CrB:		
Cookport (50%)	13	0
Nallen (35%)	10	0
CtB:		
Cotaco (75%)	11	0
CxA:		
Craigsville, rarely flooded (90%)	18	0
DkC:		
Dekalb (80%)	10	0
DrE:		
Dekalb (55%)	9	0
Rock outcrop (15%)	0	0
GaB:		
Gilpin (80%)	6	0
GaC:		
Gilpin (70%)	7	0
GaD:		
Gilpin (70%)	7	0
GbE:		
Gilpin (60%)	7	0
Berks (20%)	11	0
GhG:		
Gilpin (45%)	4	0
Highsplint (25%)	10	0
Berks (20%)	8	0
HgE:		
Highsplint (70%)	10	0
ImC:		
Itmann (100%)	1	0
ImF:		
Itmann (100%)	1	0

Table 22.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m^2	kg/m^2
KmC:		
Kaymine, bench (70%)	4	0
KrF:		
Kaymine, outslope (35%)	4	0
Kaymine, bench (35%)		
Rock outcrop, highwall (10%)	0	0
KwA:		
Knowlton, rarely flooded (70%)	15	0
LaC:		
Laidig (70%)	11	0
LeF:		
Layland (45%)	12	0
Dekalb (30%)	13	0
Guyandotte (15%)	17	0
LgG:		
Layland (45%)	13	0
Dekalb (30%)	11	0
Rock outcrop (10%)	0	0
LhE:		
Layland (60%)	13	0
Laidig (25%)	10	0
LlB:		
Lily (70%)	10	0
LlC:		
Lily (70%)	10	0
LrA:		
Lithic Hapludolls, rarely flooded (80%)	18	0
Rock outcrop (20%)	0	0
LxG:		
Lithic Udorthents, cut land (50%)	0	0
Rock outcrop (40%)	0	0
NfC:		
Nallen (65%)	10	0
Fenwick (15%)	12	0
PhA:		
Philo, occasionally flooded (50%)	8	0
Pope, occasionally flooded (30%)	19	0

Table 22.—Total Soil Carbon—Continued

Map unit symbol, component name, and component percent	SOC	SIC
	kg/m^2	kg/m^2
PkC:		
Pipestem (85%)	19	0
PmE:		
Pipestem (80%)	19	0
PxA:		
Potomac, frequently flooded (60%)	11	0
Nelse, frequently flooded (20%)	26	0
Qs:		
Quarry, sandstone (100%)	0	0
Rw:		
Riverwash, frequently flooded (95%)	0	0
UgC:		
Udorthents, graded (85%)	0	0
UgF:		
Udorthents, graded (85%)	0	0
Ur:		
Udorthents, railroad grade (93%)	0	0
Uu:		
Udorthents, highways (70%)	0	0
Urban land, highways (25%)	0	0
W:		
Water (100%)	0	0

Table 23.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
AtA:				
Atkins, frequently flooded	0-3	---	5.0-60.0	3.8-5.2
	3-5	---	10.0-75.0	3.5-5.0
	5-13	7.0-18.0	6.0-14.0	4.5-5.5
	13-20	7.0-18.0	6.0-14.0	4.5-5.5
	20-66	0.5-15.0	0.3-11.0	4.5-5.5
	66-97	0.5-15.0	0.3-11.0	4.5-5.5
	97-165	4.0-13.0	3.0-10.0	4.5-5.5
CaC:				
Cateache	0-2	---	5.0-60.0	4.5-5.5
	2-9	---	4.0-10.0	4.5-6.1
	9-75	---	7.4-12.0	4.7-6.2
	75-92	---	8.1-17.3	4.6-6.2
	92-102	---	---	---
CbD:				
Cateache	0-2	---	5.0-60.0	4.5-5.5
	2-9	---	4.0-10.0	4.5-6.1
	9-75	---	7.4-12.0	4.7-6.2
	75-92	---	8.1-17.3	4.6-6.2
	92-102	---	---	---
CbE:				
Cateache	0-1	---	5.0-60.0	4.5-5.5
	1-9	---	4.0-10.0	4.5-6.1
	9-75	---	7.4-12.0	4.7-6.2
	75-92	---	8.1-17.3	4.6-6.2
	92-102	---	---	---
CcG:				
Cateache	0-8	---	4.0-10.0	4.5-6.1
	8-74	---	7.4-12.0	4.7-6.2
	74-91	---	8.1-17.3	4.6-6.2
	91-101	---	---	---
Pipestem	0-1	40.0-125.0	5.0-60.0	5.3-6.3
	1-11	---	5.2-9.3	5.0-5.7
	11-137	13.0-24.3	---	4.9-7.6
	137-200	12.9-23.9	---	5.1-7.8
CfC:				
Cedarcreek, bench	0-1	---	5.0-60.0	4.1-5.5
	1-10	3.6-10.6	2.7-7.9	3.6-5.5
	10-25	3.6-10.6	2.7-7.9	3.6-5.5
	25-165	6.3-9.7	4.7-7.3	3.6-5.5
CgF:				
Cedarcreek, outslope	0-1	---	5.0-60.0	4.1-5.5
	1-10	3.6-10.6	2.7-7.9	3.6-5.5
	10-25	3.6-10.6	2.7-7.9	3.6-5.5
	25-165	6.3-9.7	4.7-7.3	3.6-5.5
Cedarcreek, bench	0-1	---	5.0-60.0	4.1-5.5
	1-10	3.6-10.6	2.7-7.9	3.6-5.5
	10-25	3.6-10.6	2.7-7.9	3.6-5.5
	25-165	6.3-9.7	4.7-7.3	3.6-5.5

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
ChA:				
Chavies, rarely flooded	0-2	40.0-125.0	5.0-60.0	5.3-6.3
	2-28	1.1-8.3	---	4.5-7.3
	28-107	2.7-9.8	---	4.5-7.3
	107-165	1.1-9.7	---	4.5-7.3
ClE:				
Clifftop	0-3	---	5.0-60.0	4.1-5.5
	3-8	8.0-53.0	5.0-19.0	3.5-5.5
	8-20	5.0-22.0	3.0-7.0	3.9-5.0
	20-74	5.0-15.0	3.0-11.0	4.2-5.2
	74-91	6.0-17.0	4.0-11.0	4.4-5.0
	89-101	---	---	---
CnB:				
Clifftop	0-3	---	5.0-60.0	4.1-5.5
	3-8	8.0-53.0	5.0-19.0	3.5-5.5
	8-20	5.0-22.0	3.0-7.0	3.9-5.0
	20-74	5.0-15.0	3.0-11.0	4.2-5.2
	74-91	6.0-17.0	4.0-11.0	4.4-5.0
	91-101	---	---	---
Nallen	0-3	---	5.0-60.0	3.8-5.0
	3-4	---	10.0-75.0	3.5-4.8
	4-13	6.0-17.0	3.5-11.0	3.5-5.0
	13-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-48	3.0-6.0	2.3-4.7	3.5-5.0
	48-86	4.0-5.0	3.0-4.5	3.5-5.0
	86-96	---	---	---
CnC:				
Clifftop	0-3	---	5.0-60.0	4.1-5.5
	3-8	8.0-53.0	5.0-19.0	3.5-5.5
	8-20	5.0-22.0	3.0-7.0	3.9-5.0
	20-74	5.0-15.0	3.0-11.0	4.2-5.2
	74-91	6.0-17.0	4.0-11.0	4.4-5.0
	91-101	---	---	---
Nallen	0-3	---	5.0-60.0	3.8-5.0
	3-4	---	10.0-75.0	3.5-4.8
	4-13	6.0-17.0	3.5-11.0	3.5-5.0
	13-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-48	3.0-6.0	2.3-4.7	3.5-5.0
	48-86	4.0-5.0	3.0-4.5	3.5-5.0
	86-96	---	---	---
CnD:				
Clifftop	0-3	---	5.0-60.0	4.1-5.5
	3-8	8.0-53.0	5.0-19.0	3.5-5.5
	8-20	5.0-22.0	3.0-7.0	3.9-5.0
	20-74	5.0-15.0	3.0-11.0	4.2-5.2
	74-91	6.0-17.0	4.0-11.0	4.4-5.0
	91-101	---	---	---
Nallen	0-3	---	5.0-60.0	3.8-5.0
	3-4	---	10.0-75.0	3.5-4.8
	4-13	6.0-17.0	3.5-11.0	3.5-5.0
	13-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-48	3.0-6.0	2.3-4.7	3.5-5.0
	48-86	4.0-5.0	3.0-4.5	3.5-5.0
	86-96	---	---	---

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
CoA:				
Combs, occasionally flooded	0-25	2.8-10.0	---	5.6-7.3
	25-122	2.7-9.8	---	5.6-7.3
	122-200	2.7-9.8	---	5.6-7.3
CpA:				
Combs, occasionally flooded	0-25	5.0-10.0	3.8-7.5	5.6-7.3
	25-122	3.0-12.0	1.8-6.0	5.6-7.3
	122-200	3.0-12.0	1.8-6.0	5.6-7.3
Potomac, occasionally flooded	0-2	40.0-125.0	5.0-60.0	5.3-6.3
	2-20	6.8-12.8	4.5-6.0	5.1-7.8
	20-200	2.0-6.0	0.5-4.0	5.1-7.8
CrB:				
Cookport	0-3	---	10.0-75.0	3.5-4.8
	3-8	2.8-30.8	1.9-11.0	3.5-5.0
	8-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-56	2.9-8.9	2.3-4.7	3.5-5.0
	56-107	4.0-10.9	2.7-8.4	3.5-5.0
	107-124	3.2-5.6	2.3-4.9	4.5-5.0
	124-134	---	---	---
Nallen	0-3	---	5.0-60.0	3.8-5.0
	3-4	---	10.0-75.0	3.5-4.8
	4-13	6.0-17.0	3.5-11.0	3.5-5.0
	13-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-48	3.0-6.0	2.3-4.7	3.5-5.0
	48-86	4.0-5.0	3.0-4.5	3.5-5.0
	86-96	---	---	---
CtB:				
Cotaco	0-4	---	5.0-60.0	3.8-5.2
	4-6	---	10.0-75.0	3.5-5.0
	6-23	3.0-10.0	---	3.6-5.5
	23-30	---	1.4-5.2	3.6-5.5
	30-53	---	3.5-8.2	3.6-5.5
	53-93	---	3.5-8.0	3.6-5.5
	93-123	---	3.5-8.3	3.6-5.5
	123-200	---	3.6-8.8	3.6-5.5
CxA:				
Craigsville, rarely flooded	0-5	---	5.0-60.0	3.8-5.2
	5-8	---	10.0-75.0	3.5-5.0
	8-21	4.0-16.5	3.0-12.4	4.5-5.5
	21-60	2.4-9.8	1.8-7.3	4.5-5.5
	60-200	0.7-7.1	0.5-5.3	4.5-5.5
DkC:				
Dekalb	0-1	---	5.0-60.0	3.8-5.0
	1-3	---	10.0-75.0	3.5-4.5
	3-8	11.0-68.0	7.8-13.5	3.5-5.5
	8-20	6.8-12.8	4.5-6.0	3.6-5.4
	20-65	3.4-7.4	1.6-7.2	3.6-5.4
	65-80	3.4-7.3	1.8-6.0	3.6-5.4
	80-90	---	---	---

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
DrE:				
Dekalb	0-1	---	5.0-60.0	3.8-5.0
	1-3	---	10.0-75.0	3.5-4.5
	3-8	11.0-68.0	7.8-13.5	3.5-5.5
	8-20	6.8-12.8	4.5-6.0	3.6-5.4
	20-65	3.4-7.4	1.6-7.2	3.6-5.4
	65-80	3.4-7.3	1.8-6.0	3.6-5.4
	80-90	---	---	---
GaB:				
Gilpin	0-1	---	5.0-60.0	4.1-5.5
	1-2	---	10.0-75.0	3.9-5.3
	2-16	---	1.0-7.6	3.5-5.5
	16-29	---	0.0-8.7	3.5-5.5
	29-70	---	5.6-13.0	4.2-5.2
	70-76	---	6.1-16.0	4.4-5.0
	76-96	---	---	---
GaC:				
Gilpin	0-2	---	5.0-60.0	4.1-5.5
	2-10	---	1.0-7.6	3.5-5.5
	10-32	---	0.0-8.7	3.5-5.5
	32-63	---	5.6-13.0	4.2-5.2
	63-76	---	6.1-16.0	4.4-5.0
	76-96	---	---	---
GaD:				
Gilpin	0-2	---	5.0-60.0	4.1-5.5
	2-8	---	1.0-7.6	3.5-5.5
	8-32	---	0.0-8.7	3.5-5.5
	32-63	---	5.6-13.0	4.2-5.2
	63-76	---	6.1-16.0	4.4-5.0
	76-96	---	---	---
GbE:				
Gilpin	0-3	---	5.0-60.0	4.1-5.5
	3-8	---	1.0-7.6	3.5-5.5
	8-32	---	0.0-8.7	3.5-5.5
	32-63	---	5.6-13.0	4.2-5.2
	63-76	---	6.1-16.0	4.4-5.0
	76-96	---	---	---
Berks	0-3	40.0-125.0	5.0-60.0	5.1-6.1
	3-13	---	3.0-5.7	4.2-6.1
	13-24	---	3.3-6.7	4.4-5.3
	24-85	---	3.9-7.6	4.4-5.2
	85-94	---	4.8-9.7	4.6-5.4
	94-104	---	---	---
GhG:				
Gilpin	0-5	---	1.0-7.6	3.5-5.5
	5-22	---	0.0-8.7	3.5-5.5
	22-53	---	5.6-13.0	4.2-5.2
	53-66	---	6.1-16.0	4.4-5.0
	66-86	---	---	---

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
GhG:				
Highsplint-----------	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-18	---	3.0-7.2	4.5-6.0
	18-27	---	3.5-8.0	4.0-5.5
	27-108	---	3.7-10.8	3.5-5.5
	108-135	---	1.8-9.6	3.5-5.5
	135-165	---	3.9-10.4	3.5-5.5
Berks----------------	0-5	---	3.0-5.7	4.2-6.1
	5-16	---	3.3-6.7	4.4-5.3
	16-77	---	3.9-7.6	4.4-5.2
	77-86	---	4.8-9.7	4.6-5.4
	86-96	---	---	---
HgE:				
Highsplint-----------	0-3	40.0-125.0	5.0-60.0	5.1-6.1
	3-18	10.4-19.0	4.0-15.1	4.5-6.0
	18-27	5.3-9.9	2.8-5.5	4.0-5.5
	27-108	4.9-9.7	2.5-6.3	3.5-5.5
	108-135	6.2-8.7	3.6-5.4	3.5-5.5
	135-165	5.6-8.6	3.9-6.0	3.5-5.5
ImC:				
Itmann---------------	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-9	1.1-6.1	0.8-4.6	5.1-7.3
	9-165	0.0-7.0	0.0-5.2	5.6-7.8
ImF:				
Itmann---------------	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-9	2.6-5.4	---	5.1-7.3
	9-165	1.4-5.2	---	5.6-7.8
KmC:				
Kaymine, bench-------	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-33	9.6-14.7	---	5.6-7.8
	33-165	9.4-14.2	---	5.6-7.8
KrF:				
Kaymine, outslope----	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-33	9.6-14.7	---	5.6-7.8
	33-165	9.4-14.2	---	5.6-7.8
Kaymine, bench-------	0-1	40.0-125.0	5.0-60.0	5.1-6.1
	1-33	9.6-14.7	---	5.6-7.8
	33-165	9.4-14.2	---	5.6-7.8
KwA:				
Knowlton, rarely flooded-------------	0-2	---	10.0-75.0	3.5-5.0
	2-25	---	1.3-4.7	3.6-5.5
	25-43	---	1.4-5.2	3.6-5.5
	43-56	---	1.3-5.4	3.6-5.5
	56-165	---	1.3-8.0	3.6-5.5
LaC:				
Laidig---------------	0-2	---	5.0-60.0	3.8-5.2
	2-9	9.9-62.9	4.5-16.8	3.9-4.3
	9-19	6.1-21.3	3.3-8.2	3.9-4.6
	19-80	4.4-9.2	2.4-4.9	4.4-4.8
	80-122	4.7-10.2	2.9-5.4	4.6-4.9
	122-200	3.8-9.9	2.3-4.3	4.4-5.1

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
LeF:				
Layland	0-3	---	5.0-60.0	3.8-5.2
	3-5	---	10.0-75.0	3.5-5.0
	5-15	0.0-29.4	5.4-16.3	3.5-5.0
	15-23	6.9-9.3	4.3-6.4	3.5-5.0
	23-117	4.3-7.4	3.3-5.6	3.5-5.0
	117-145	6.5-7.8	4.9-9.5	3.5-5.0
	145-200	6.5-7.8	4.9-9.5	3.5-5.0
Dekalb	0-1	---	5.0-60.0	3.8-5.0
	1-3	---	10.0-75.0	3.5-4.5
	3-8	11.0-68.0	7.8-13.5	3.5-5.5
	8-20	6.8-12.8	4.5-6.0	3.6-5.4
	20-65	3.4-7.4	1.6-7.2	3.6-5.4
	65-80	3.4-7.3	1.8-6.0	3.6-5.4
	80-90	---	---	---
Guyandotte	0-2	40.0-125.0	5.0-60.0	4.3-5.7
	2-31	8.4-38.9	4.0-22.9	4.3-5.8
	31-46	6.9-7.4	3.3-3.9	4.7-5.8
	46-140	4.2-9.1	2.6-6.9	4.8-5.6
	140-200	5.7-9.5	3.1-5.9	4.9-6.0
LgG:				
Layland	0-3	---	5.0-60.0	3.8-5.2
	3-5	---	10.0-75.0	3.5-5.0
	5-15	0.0-29.4	5.4-16.3	3.5-5.0
	15-23	6.9-9.3	4.3-6.4	3.5-5.0
	23-117	4.3-7.4	3.3-5.6	3.5-5.0
	117-145	6.5-7.8	4.9-9.5	3.5-5.0
	145-200	6.5-7.8	4.9-9.5	3.5-5.0
Dekalb	0-5	11.0-68.0	7.8-13.5	3.5-5.5
	5-17	6.8-12.8	4.5-6.0	3.6-5.4
	17-62	3.4-7.4	1.6-7.2	3.6-5.4
	62-77	3.4-7.3	1.8-6.0	3.6-5.4
	77-87	---	---	---
LhE:				
Layland	0-3	---	5.0-60.0	3.8-5.2
	3-5	---	10.0-75.0	3.5-5.0
	5-15	0.0-29.4	5.4-16.3	3.5-5.0
	15-23	6.9-9.3	4.3-6.4	3.5-5.0
	23-117	4.3-7.4	3.3-5.6	3.5-5.0
	117-145	6.5-7.8	4.9-9.5	3.5-5.0
	145-200	6.5-7.8	4.9-9.5	3.5-5.0
Laidig	0-2	---	5.0-60.0	3.8-5.2
	2-9	9.9-62.9	4.5-16.8	3.9-4.3
	9-19	6.1-21.3	3.3-8.2	3.9-4.6
	19-80	4.4-9.2	2.4-4.9	4.4-4.8
	80-122	4.7-10.2	2.9-5.4	4.6-4.9
	122-200	3.8-9.9	2.3-4.3	4.4-5.1
LlB:				
Lily	0-2	---	5.0-60.0	3.8-5.0
	2-5	---	10.0-75.0	3.5-4.8
	5-11	---	1.4-3.1	3.5-5.0
	11-19	---	1.3-3.8	3.5-5.0
	19-78	---	1.6-5.3	3.5-5.0
	78-90	---	0.9-3.7	3.5-5.0
	90-100	---	---	---

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
LlC:				
Lily	0-2	---	5.0-60.0	3.8-5.0
	2-5	---	10.0-75.0	3.5-4.8
	5-11	---	1.4-3.1	3.5-5.0
	11-19	---	1.3-3.8	3.5-5.0
	19-78	---	1.6-5.3	3.5-5.0
	78-90	---	0.9-3.7	3.5-5.0
	90-100	---	---	---
LrA:				
Lithic Hapludolls, rarely flooded	0-20	2.2-10.0	---	5.1-7.2
	20-38	2.2-10.0	---	5.1-7.2
	38-46	2.2-9.9	---	5.1-7.2
	46-56	---	---	---
LxG:				
Lithic Udorthents, cut land	0-10	---	---	3.6-7.5
	10-22	---	---	3.6-7.5
	22-32	---	---	---
NfC:				
Nallen	0-3	---	5.0-60.0	3.8-5.0
	3-4	---	10.0-75.0	3.5-4.8
	4-13	6.0-17.0	3.5-11.0	3.5-5.0
	13-23	3.0-7.0	3.0-6.0	3.5-5.0
	23-48	3.0-6.0	2.3-4.7	3.5-5.0
	48-86	4.0-5.0	3.0-4.5	3.5-5.0
	86-96	---	---	---
Fenwick	0-3	---	10.0-75.0	3.9-5.3
	3-8	---	1.5-4.7	3.5-5.0
	8-23	---	1.6-4.8	4.0-5.0
	23-66	---	3.6-7.3	4.0-5.0
	66-86	---	3.2-7.3	4.0-5.0
	86-99	---	2.9-6.5	4.0-5.0
	99-109	---	---	---
PhA:				
Philo, occasionally flooded	0-5	---	5.0-60.0	3.8-5.2
	5-23	7.0-18.0	5.0-14.0	4.5-6.0
	23-76	0.0-11.0	0.0-8.0	4.5-6.0
	76-165	0.0-11.0	0.0-8.0	4.5-6.0
Pope, occasionally flooded	0-3	---	5.0-60.0	3.8-5.2
	3-5	---	10.0-75.0	3.5-5.0
	5-18	4.0-14.2	3.0-10.7	3.6-5.5
	18-81	2.4-10.8	1.8-8.1	3.6-5.5
	81-200	2.4-10.6	1.8-8.0	3.6-5.5
PkC:				
Pipestem	0-1	40.0-125.0	5.0-60.0	5.3-6.3
	1-11	---	5.2-9.3	5.0-5.7
	11-137	13.0-24.3	---	4.9-7.6
	137-200	12.9-23.9	---	5.1-7.8

Table 23.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Cm	meq/100 g	meq/100 g	pH
PmE:				
Pipestem	0-1	40.0-125.0	5.0-60.0	5.3-6.3
	1-11	---	5.2-9.3	5.0-5.7
	11-137	13.0-24.3	---	4.9-7.6
	137-200	12.9-23.9	---	5.1-7.8
PxA:				
Potomac, frequently flooded	0-2	40.0-125.0	5.0-60.0	5.3-6.3
	2-20	6.8-12.8	4.5-6.0	5.1-7.8
	20-200	2.0-6.0	0.5-4.0	5.1-7.8
Nelse, frequently flooded	0-30	8.2-14.9	6.2-11.2	5.1-7.3
	30-74	1.8-8.2	---	5.5-7.3
	74-200	1.8-8.2	---	5.5-7.3
UgC:				
Udorthents, graded	0-4	---	---	3.6-7.5
	4-27	---	---	3.6-7.5
	27-165	---	---	3.6-7.5
UgF:				
Udorthents, graded	0-4	---	---	3.6-7.5
	4-27	---	---	3.6-7.5
	27-165	---	---	3.6-7.5
Uu:				
Udorthents, highways	0-4	---	---	3.6-7.5
	4-27	---	---	3.6-7.5
	27-165	---	0.0-3.5	3.6-7.5

Table 24.—Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map unit symbol and soil name	Hydrologic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
AtA:									
Atkins, frequently flooded	D								
		January	0	>200	3-15	Long	Frequent	Very brief	Frequent
		February	0	>200	3-15	Long	Frequent	Very brief	Frequent
		March	0	>200	3-15	Long	Frequent	Very brief	Frequent
		April	0	>200	3-15	Long	Frequent	Very brief	Frequent
		May	15	>200	3-15	Long	Frequent	Very brief	Frequent
		June	15	>200	---	---	---	---	---
		July	30	>200	---	---	---	---	---
		September	30	>200	---	---	---	---	---
		October	30	>200	---	---	---	---	---
		November	15	>200	3-15	Long	Frequent	Very brief	Frequent
		December	15	>200	3-15	Long	Frequent	Very brief	Frequent
CaC:									
Cateache	C								
		---	---	---	---	---	---	---	---
CbD:									
Cateache	C								
		---	---	---	---	---	---	---	---
CbE:									
Cateache	C								
		---	---	---	---	---	---	---	---
CcG:									
Cateache	C								
		---	---	---	---	---	---	---	---
Pipestem	B								
		---	---	---	---	---	---	---	---
CfC:									
Cedarcreek, bench	C								
		---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
CgF:									
Cedarcreek, outslope	C								
		---	---	---	---	---	---	---	---
Cedarcreek, bench	C								
		---	---	---	---	---	---	---	---
Rock outcrop, highwall.									
ChA:									
Chavies, rarely flooded	A								
		January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		November	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare
ClE:									
Clifftop	C								
		---	---	---	---	---	---	---	---
CnB:									
Clifftop	C								
		---	---	---	---	---	---	---	---
Nallen	B								
		---	---	---	---	---	---	---	---
CnC:									
Clifftop	C								
		---	---	---	---	---	---	---	---
Nallen	B								
		---	---	---	---	---	---	---	---
CnD:									
Clifftop	C								
		---	---	---	---	---	---	---	---
Nallen	B								
		---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydrologic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
CoA:									
Combs, occasionally flooded	A								
		January	137	>200	---	---	None	Brief	Occasional
		February	137	>200	---	---	None	Brief	Occasional
		March	137	>200	---	---	None	Brief	Occasional
		April	137	>200	---	---	None	Brief	Occasional
		May	137	>200	---	---	None	Brief	Occasional
		November	137	>200	---	---	None	Brief	Occasional
		December	137	>200	---	---	None	Brief	Occasional
CpA:									
Combs, occasionally flooded	A	January	137	>200	---	---	None	Very brief	Occasional
		February	137	>200	---	---	None	Very brief	Occasional
		March	137	>200	---	---	None	Very brief	Occasional
		April	137	>200	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
CpA:									
Potomac, occasionally flooded	A								
		January	---	---	---	---	None	Very brief	Occasional
		February	---	---	---	---	None	Very brief	Occasional
		March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Occasional
		December	---	---	---	---	None	Very brief	Occasional
CrB:									
Cookport	D								
		January	43	56	---	---	None	---	None
		February	43	56	---	---	None	---	None
		March	43	56	---	---	None	---	None
		April	43	56	---	---	None	---	None
		November	43	56	---	---	None	---	None
		December	43	56	---	---	None	---	None
Nallen	B								
		---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
CtB:									
Cotaco	C								
		January	58	>200	---	---	None	---	None
		February	58	>200	---	---	None	---	None
		March	58	>200	---	---	None	---	None
		April	58	>200	---	---	None	---	None
		May	58	>200	---	---	None	---	None
		November	58	>200	---	---	None	---	None
		December	58	>200	---	---	None	---	None
CxA:									
Craigsville, rarely flooded	A								
		January	137	>200	---	---	None	Very brief	Rare
		February	137	>200	---	---	None	Very brief	Rare
		March	137	>200	---	---	None	Very brief	Rare
		April	137	>200	---	---	None	Very brief	Rare
		May	137	>200	---	---	None	Very brief	Rare
		November	137	>200	---	---	None	Very brief	Rare
		December	137	>200	---	---	None	Very brief	Rare
DkC:									
Dekalb	A								
		---	---	---	---	---	---	---	---
DrE:									
Dekalb	A								
		---	---	---	---	---	---	---	---
Rock outcrop.									
GaB:									
Gilpin	C	---	---	---	---	---	---	---	---
GaC:									
Gilpin	C								
		---	---	---	---	---	---	---	---
GaD:									
Gilpin	C								
		---	---	---	---	---	---	---	---
GbE:									
Gilpin	C								
		---	---	---	---	---	---	---	---
Berks	B								
		---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
GhG:									
Gilpin	C								
		---	---	---	---	---	---	---	---
Highsplint	B								
		---	---	---	---	---	---	---	---
Berks	B								
		---	---	---	---	---	---	---	---
HgE:									
Highsplint	B								
		---	---	---	---	---	---	---	---
ImC:									
Itmann	A								
		---	---	---	---	---	---	---	---
ImF:									
Itmann	A								
KmC:									
Kaymine, bench	C								
		---	---	---	---	---	---	---	---
KrF:									
Kaymine, outslope	C								
		---	---	---	---	---	---	---	---
Kaymine, bench	C								
		---	---	---	---	---	---	---	---
Rock outcrop.									
KwA:									
Knowlton, rarely flooded	D								
		January	15	>200	---	---	None	Very brief	Rare
		February	15	>200	---	---	None	Very brief	Rare
		March	15	>200	---	---	None	Very brief	Rare
		April	15	>200	---	---	None	Very brief	Rare
		May	76	>200	---	---	None	Very brief	Rare
		June	106	>200	---	---	None	---	---
		July	137	>200	---	---	None	---	---
		August	137	>200	---	---	None	---	---
		September	137	>200	---	---	None	---	---
		October	137	>200	---	---	None	Very brief	Rare
		November	107	>200	---	---	None	Very brief	Rare
		December	15	>200	---	---	None	Very brief	Rare

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
LaC:									
Laidig	C								
		January	80	122	---	---	None	---	None
		February	80	122	---	---	None	---	None
		March	80	122	---	---	None	---	None
LeF:									
Layland	B								
		---	---	---	---	---	---	---	---
Dekalb	A								
		---	---	---	---	---	---	---	---
Guyandotte	A								
		---	---	---	---	---	---	---	---
LgG:									
Layland	B								
		---	---	---	---	---	---	---	---
Dekalb	A								
		---	---	---	---	---	---	---	---
Rock outcrop.									
LhE:									
Layland	B								
		---	---	---	---	---	---	---	---
Laidig	C								
		January	80	122	---	---	None	---	None
		February	80	122	---	---	None	---	None
		March	80	122	---	---	None	---	None
LlB:									
Lily	B								
		---	---	---	---	---	---	---	---
LlC:									
Lily	B								
		---	---	---	---	---	---	---	---

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydrologic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
LrA:									
Lithic Hapludolls, rarely flooded	C								
		January	---	---	---	---	None	Very brief	Rare
		February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Rare
		April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		November	---	---	---	---	None	Very brief	Rare
		December	---	---	---	---	None	Very brief	Rare
Rock outcrop.									
LxG:									
Lithic Udorthents, cut land	D								
		---	---	---	---	---	---	---	---
Rock outcrop.									
NfC:									
Nallen	B								
		---	---	---	---	---	---	---	---
Fenwick	C								
		January	48	99	---	---	None	---	None
		February	48	99	---	---	None	---	None
		March	48	99	---	---	None	---	None
		April	48	99	---	---	None	---	None
		November	48	99	---	---	None	---	None
		December	48	99	---	---	None	---	None
PhA:									
Philo, occasionally flooded	C								
		January	69	>200	---	---	None	Brief	Occasional
		February	69	>200	---	---	None	Brief	Occasional
		March	69	>200	---	---	None	Brief	Occasional
		April	69	>200	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		November	69	>200	---	---	None	Brief	Occasional
		December	69	>200	---	---	None	Brief	Occasional
Pope, occasionally flooded	A								
		January	---	---	---	---	None	Brief	Occasional
		February	---	---	---	---	None	Brief	Occasional
		March	---	---	---	---	None	Brief	Occasional
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		November	---	---	---	---	None	Brief	Occasional
		December	---	---	---	---	None	Brief	Occasional

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
PkC:									
Pipestem	B								
		---	---	---	---	---	---	---	---
PmE:									
Pipestem	B								
		---	---	---	---	---	---	---	---
PxA:									
Potomac, frequently flooded	A								
		January	---	---	---	---	None	Brief	Frequent
		February	---	---	---	---	None	Brief	Frequent
		March	---	---	---	---	None	Brief	Frequent
		April	---	---	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		November	---	---	---	---	None	Brief	Frequent
		December	---	---	---	---	None	Brief	Frequent
Nelse, frequently flooded	B								
		January	153	>200	---	---	None	Brief	Frequent
		February	153	>200	---	---	None	Brief	Frequent
		March	153	>200	---	---	None	Brief	Frequent
		April	153	>200	---	---	None	Brief	Frequent
		May	153	>200	---	---	None	Brief	Frequent
		June	160	>200	---	---	None	---	---
		July	160	>200	---	---	None	---	---
		August	160	>200	---	---	None	---	---
		September	160	>200	---	---	None	---	---
		October	160	>200	---	---	None	---	---
		November	153	>200	---	---	None	Brief	Frequent
		December	153	>200	---	---	None	Brief	Frequent
Qs.									
Quarry, sandstone									
Rw:									
Riverwash, frequently flooded	---								
		January	---	---	---	---	None	Long	Frequent
		February	---	---	---	---	None	Long	Frequent
		March	---	---	---	---	None	Long	Frequent
		April	---	---	---	---	None	Long	Frequent
		May	---	---	---	---	None	Long	Frequent
		November	---	---	---	---	None	Long	Frequent
		December	---	---	---	---	None	Long	Frequent
UgC.									
Udorthents, graded									

Table 24.—Water Features—Continued

Map unit symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Cm	Cm	Cm				
UgF. Udorthents, graded									
Ur. Udorthents, railroad grade									
Uu. Udorthents-Urban land, highways									
W. Water									

Table 25.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that data were not estimated)

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		Cm	Cm				
AtA:							
Atkins, frequently flooded	No restriction	---	---	---	High	High	Moderate
CaC:							
Cateache	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	Moderate
CbD:							
Cateache	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	Moderate
CbE:							
Cateache	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	Moderate
CcG:							
Cateache	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	Moderate
Pipestem	No restriction	---	---	---	Moderate	Moderate	Moderate
CfC:							
Cedarcreek, bench	No restriction	---	---	---	Moderate	Low	High
CgF:							
Cedarcreek, outslope	No restriction	---	---	---	Moderate	Low	High
Cedarcreek, bench	No restriction	---	---	---	Moderate	Low	High
Rock outcrop, highwall	Lithic bedrock	0-0	---	Indurated	---	---	---
ChA:							
Chavies, rarely flooded	No restriction	---	---	---	Moderate	Low	Moderate
ClE:							
Clifftop	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
CnB:							
Clifftop	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
Nallen	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High

Table 25.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		Cm	Cm				
CnC:							
Clifftop	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
Nallen	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
CnD:							
Clifftop	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
Nallen	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
CoA:							
Combs, occasionally flooded	No restriction	---	---	---	Moderate	Moderate	Moderate
CpA:							
Combs, occasionally flooded	No restriction	---	---	---	Moderate	Moderate	Moderate
Potomac, occasionally flooded	No restriction	---	---	---	Low	Low	Low
CrB:							
Cookport	Fragipan	41-76	---	Noncemented	Moderate	High	High
	Lithic bedrock	102-183		Strongly cemented			
Nallen	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
CtB:							
Cotaco	No restriction	---	---	---	Moderate	High	High
CxA:							
Craigsville, rarely flooded	No restriction	---	---	---	Moderate	Moderate	High
DkC:							
Dekalb	Lithic bedrock	51-102	---	Indurated	Moderate	High	High
DrE:							
Dekalb	Lithic bedrock	51-102	---	Indurated	Moderate	High	High
Rock outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---
GaB:							
Gilpin	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
GaC:							
Gilpin	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High

Table 25.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		Cm	Cm				
GaD:							
Gilpin	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
GbE:							
Gilpin	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
Berks	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
GhG:							
Gilpin	Paralithic bedrock	51-102	---	Moderately cemented	Moderate	Moderate	High
Highsplint	No restriction	---	---	---	Moderate	Moderate	High
Berks	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
HgE:							
Highsplint	No restriction	---	---	---	Moderate	Moderate	High
ImC:							
Itmann	No restriction	---	---	---	Moderate	High	Low
ImF:							
Itmann	No restriction	---	---	---	Moderate	Low	Low
KmC:							
Kaymine, bench	No restriction	---	---	---	Moderate	Low	Low
KrF:							
Kaymine, outslope	No restriction	---	---	---	Moderate	Low	Low
Kaymine, bench	No restriction	---	---	---	Moderate	Low	Low
Rock outcrop, highwall	Lithic bedrock	0-0	---	Indurated	---	---	---
KwA:							
Knowlton, rarely flooded	No restriction	---	---	---	High	High	High
LaC:							
Laidig	Fragipan	76-127	41-132	Noncemented	Moderate	High	High

Table 25.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		Cm	Cm				
LeF:							
Layland	Lithic bedrock	152-305	---	Very strongly cemented	Moderate	High	High
Dekalb	Lithic bedrock	51-102	---	Indurated	Moderate	High	High
Guyandotte	No restriction	---	---	---	Moderate	Moderate	Moderate
LgG:							
Layland	Lithic bedrock	152-305	---	Very strongly cemented	Moderate	High	High
Dekalb	Lithic bedrock	51-102	---	Indurated	Moderate	High	High
Rock outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---
LhE:							
Layland	Lithic bedrock	152-305	---	Very strongly cemented	Moderate	High	High
Laidig	Fragipan	76-127	41-132	Noncemented	Moderate	High	High
LlB:							
Lily	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
LlC:							
Lily	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
LrA:							
Lithic Hapludolls, rarely flooded	Lithic bedrock	25-51	---	Indurated	Moderate	Low	Low
Rock outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---
LxG:							
Lithic Udorthents, cut land	Lithic bedrock	10-50	---	Indurated	---	---	---
Rock outcrop	Lithic bedrock	0-0	---	Indurated	---	---	---
NfC:							
Nallen	Lithic bedrock	51-102	---	Indurated	Moderate	Moderate	High
Fenwick	Lithic bedrock	51-109	---	Strongly cemented	Moderate	High	High
PhA:							
Philo, occasionally flooded	No restriction	---	---	---	Moderate	High	Moderate
Pope, occasionally flooded	No restriction	---	---	---	Moderate	Moderate	High

Table 25.—Soil Features—Continued

Map unit symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		Cm	Cm				
PkC:							
Pipestem	No restriction	---	---	---	Moderate	Moderate	Moderate
PmE:							
Pipestem	No restriction	---	---	---	Moderate	Moderate	Moderate
PxA:							
Potomac, frequently flooded	No restriction	---	---	---	Low	Low	Low
Nelse, frequently flooded	No restriction	---	---	---	Low	Low	Moderate
Qs.							
Quarry, sandstone							
Rw.							
Riverwash, frequently flooded							
UgC.							
Udorthents, graded							
UgF.							
Udorthents, graded							
Ur.							
Udorthents, railroad grade							
Uu.							
Udorthents-Urban land, highways							
W.							
Water							

Table 26.—Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Atkins	Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts
Berks	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
Cateache	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Cedarcreek	Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents
Chavies	Coarse-loamy, mixed, active, mesic Ultic Hapludalfs
Clifftop	Fine-loamy, mixed, semiactive, mesic Typic Hapludults
Combs	Coarse-loamy, mixed, active, mesic Fluventic Hapludolls
*Cookport	Fine-loamy, mixed, semiactive, mesic Aquic Fragiudults
Cotaco	Fine-loamy, mixed, semiactive, mesic Aquic Hapludults
Craigsville	Loamy-skeletal, mixed, superactive, mesic Fluventic Dystrudepts
*Dekalb	Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts
Fenwick	Fine-loamy, mixed, semiactive, mesic Aquic Hapludults
Gilpin	Fine-loamy, mixed, active, mesic Typic Hapludults
Guyandotte	Loamy-skeletal, mixed, active, mesic Typic Humudepts
Highsplint	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
*Itmann	Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents
Kaymine	Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents
*Knowlton	Fine-loamy, mixed, semiactive, mesic Typic Endoaquults
*Laidig	Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults
Layland	Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts
Lily	Fine-loamy, siliceous, semiactive, mesic Typic Hapludults
Lithic Hapludolls	Loamy-skeletal, mixed, active, mesic Lithic Hapludolls
Lithic Udorthents	Mesic Lithic Udorthents
Nallen	Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults
*Nelse	Sandy, mixed, active, nonacid, mesic Mollic Udifluvents
Philo	Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts
Pipestem	Fine, mixed, active, mesic Dystric Eutrudepts
Pope	Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts
Potomac	Sandy-skeletal, mixed, mesic Typic Udifluvents
Udorthents	Mesic Udorthents

Table 27.—Soil Classification Key

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

- ORDER
  - Suborder
    - Great Group
      - Subgroup
        - Series or Higher Category

- ALFISOLS
  - Udalfs
    - Fragiudalfs
      - Oxyaquic Fragiudalfs
        - Hustontown----------Fine-loamy, mixed, semiactive, mesic Aquic Fragiudalfs
    - Hapludalfs
      - Typic Hapludalfs
        - Kanawha-------------Fine-loamy, mixed, active, mesic Typic Hapludalfs
      - Ultic Hapludalfs
        - Chavies-------------Coarse-loamy, mixed, active, mesic Ultic Hapludalfs
        - Cateache------------Fine-loamy, mixed, active, mesic Ultic Hapludalfs

- ENTISOLS
  - Fluvents
    - Udifluvents
      - Typic Udifluvents
        - Yeager--------------Sandy, mixed, mesic Typic Udifluvents
        - Potomac-------------Sandy-skeletal, mixed, mesic Typic Udifluvents
      - Mollic Udifluvents
        - *Nelse---------------Sandy, mixed, active, nonacid, mesic Mollic Udifluvents
  - Orthents
    - Udorthents
        - Udorthents----------Udorthents
      - Typic Udorthents
        - Cedarcreek----------Loamy-skeletal, mixed, active, acid, mesic Typic Udorthents
        - Kaymine-------------Loamy-skeletal, mixed, active, nonacid, mesic Typic Udorthents
        - Sewell--------------Loamy-skeletal, mixed, semiactive, acid, mesic Typic Udorthents
        - Fiveblock-----------Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents
        - *Itmann--------------Loamy-skeletal, mixed, semiactive, nonacid, mesic Typic Udorthents
      - Lithic Udorthents
        - Lithic Udorthents---Lithic Udorthents
      - Oxyaquic Udorthents
        - *Cedarcreek----------Loamy-skeletal, mixed, active, acid, mesic Oxyaquic Udorthents
        - *Kaymine-------------Loamy-skeletal, mixed, active, nonacid, mesic Oxyaquic Udorthents
  - Psamments
    - Quartzipsamments
      - Lithic Quartzipsamments
        - Totz----------------Mesic, coated Lithic Quartzipsamments

- INCEPTISOLS
  - Aquepts
    - Endoaquepts
        - *Endoaquepts---------Fine-loamy, mixed, semiactive, mesic Typic Fragiaquults
      - Fluvaquentic Endoaquepts
        - Atkins--------------Fine-loamy, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Table 27.—Soil Classification Key—Continued

- **ORDER**
  - **Suborder**
    - **Great Group**
      - **Subgroup**
        - **Series or Higher Category**

- **INCEPTISOLS (Continued)**
  - **Udepts**
    - **Dystrudepts**
      - **Lithic Dystrudepts**
        - Weikert-------------Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts
      - **Fluvaquentic Dystrudepts**
        - Philo---------------Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts
      - **Fluventic Dystrudepts**
        - Pope----------------Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts
        - Craigsville---------Loamy-skeletal, mixed, superactive, mesic Fluventic Dystrudepts
      - **Typic Dystrudepts**
        - Berks---------------Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
        - Highsplint----------Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
        - *Dekalb--------------Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts
        - Layland-------------Loamy-skeletal, siliceous, semiactive, mesic Typic Dystrudepts
    - **Eutrudepts**
      - **Fluvaquentic Eutrudepts**
        - Middlebury----------Coarse-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts
        - Lobdell-------------Fine-loamy, mixed, active, mesic Fluvaquentic Eutrudepts
      - **Dystric Fluventic Eutrudepts**
        - Grigsby-------------Coarse-loamy, mixed, active, mesic Dystric Fluventic Eutrudepts
      - **Dystric Eutrudepts**
        - Pipestem------------Fine, mixed, active, mesic Dystric Eutrudepts
    - **Humudepts**
      - **Typic Humudepts**
        - Guyandotte----------Loamy-skeletal, mixed, active, mesic Typic Humudepts

- **MOLLISOLS**
  - **Udolls**
    - **Hapludolls**
      - **Fluventic Hapludolls**
        - Combs---------------Coarse-loamy, mixed, active, mesic Fluventic Hapludolls
      - **Lithic Hapludolls**
        - Lithic Hapludolls---Loamy-skeletal, mixed, active, mesic Lithic Hapludolls

- **ULTISOLS**
  - **Aquults**
    - **Endoaquults**
      - **Typic Endoaquults**
        - *Knowlton------------Fine-loamy, mixed, semiactive, mesic Typic Endoaquults
  - **Udults**
    - **Fragiudults**
      - **Typic Fragiudults**
        - Monongahela---------Fine-loamy, mixed, semiactive, mesic Typic Fragiudults
        - *Laidig--------------Fine-loamy, siliceous, semiactive, mesic Typic Fragiudults
      - **Aquic Fragiudults**
        - *Cookport------------Fine-loamy, mixed, semiactive, mesic Aquic Fragiudults
    - **Hapludults**
      - **Typic Hapludults**
        - Nallen--------------Coarse-loamy, siliceous, semiactive, mesic Typic Hapludults
        - Gilpin--------------Fine-loamy, mixed, active, mesic Typic Hapludults
        - Pineville-----------Fine-loamy, mixed, active, mesic Typic Hapludults
        - Clifftop------------Fine-loamy, mixed, semiactive, mesic Typic Hapludults
        - Lily----------------Fine-loamy, siliceous, semiactive, mesic Typic Hapludults
        - Macove--------------Loamy-skeletal, mixed, active, mesic Typic Hapludults
      - **Aquic Hapludults**
        - Cotaco--------------Fine-loamy, mixed, semiactive, mesic Aquic Hapludults
        - Fenwick-------------Fine-loamy, mixed, semiactive, mesic Aquic Hapludults
        - Morehead------------Fine-silty, mixed, semiactive, mesic Aquic Hapludults

Appendices

Appendix 1.—West Virginia Grassland Suitability Groups

Click here for document.

Appendix 2.—Vegetation Map of New River Gorge National River, West Virginia

Click here for map.

Appendix 3.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Common Name

(Plants displayed occur within the National Soils Information System (NASIS) plant tables used for the soil survey area. The scientific and common names are referenced at the USDA PLANTS database: plants.usda.gov)

Local common name	Scientific name	Plant symbol
alder	Alnus	ALNUS
alderleaf buckthorn	Rhamnus alnifolia	RHAL
American basswood	Tilia americana	TIAM
American beech	Fagus grandifolia	FAGR
American chestnut	Castanea dentata	CADE12
American cranberrybush	Viburnum opulus var. americanum	VIOPA2
American elm	Ulmus americana	ULAM
American ginseng	Panax quinquefolius	PAQU
American holly	Ilex opaca	ILOP
American hornbeam	Carpinus caroliniana	CACA18
American sycamore	Platanus occidentalis	PLOC
American witchhazel	Hamamelis virginiana	HAVI4
autumn olive	Elaeagnus umbellata	ELUM
beggarstick	Bidens	BIDEN
bitternut hickory	Carya cordiformis	CACO15
black cherry	Prunus serotina	PRSE2
black cohosh	Cimicifuga racemosa	CIRA
black locust	Robinia pseudoacacia	ROPS
black oak	Quercus velutina	QUVE
black walnut	Juglans nigra	JUNI
blackberry	Rubus	RUBUS
blackgum	Nyssa sylvatica	NYSY
bloodroot	Sanguinaria canadensis	SACA13
blue cohosh	Caulophyllum thalictroides	CATH2
blue mistflower	Conoclinium coelestinum	COCO13
Blue Ridge blueberry	Vaccinium pallidum	VAPA4
blueberry	Vaccinium	VACCI
boxelder	Acer negundo	ACNE2
bristly dewberry	Rubus hispidus	RUHI
broomsedge bluestem	Andropogon virginicus	ANVI2
bulrush	Scirpus	SCIRP
bur-reed	Sparganium	SPARG
Canada wildrye	Elymus canadensis	ELCA4
Carolina silverbell	Halesia carolina	HACA3
checkerberry wintergreen	Gaultheria procumbens	GAPR2
chestnut oak	Quercus prinus	QUPR2
Christmas fern	Polystichum acrostichoides	POAC4
clover	Trifolium	TRIFO
common elderberry	Sambucus nigra ssp. canadensis	SANIC4
common hackberry	Celtis occidentalis	CEOC
common serviceberry	Amelanchier arborea	AMAR3
cucumbertree	Magnolia acuminata	MAAC
deertongue	Dichanthelium clandestinum	DICL
eastern cottonwood	Populus deltoides	PODE3
eastern hemlock	Tsuga canadensis	TSCA
eastern poison ivy	Toxicodendron radicans	TORA2
eastern poison ivy	Toxicodendron radicans ssp. radicans	TORAR
eastern redbud	Cercis canadensis	CECA4
eastern redcedar	Juniperus virginiana	JUVI
eastern teaberry	Gaultheria procumbens	GAPR2
eastern white pine	Pinus strobus	PIST
flowering dogwood	Cornus florida	COFL2
fringed sedge	Carex crinita	CACR6
goldenrod	Oligoneuron	OLIGO3
grass		2GP
grass, annual		2GA
grass, perennial		2GP

Appendix 3.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Common Name—Continued

Local common name	Scientific name	Plant symbol
green ash	Fraxinus pennsylvanica	FRPE
greenbrier	Smilax rotundifolia	SMRO
groundcedar	Lycopodium complanatum	LYCO3
hawthorn	Crataegus	CRATA
hazel alder	Alnus serrulata	ALSE2
hickory	Carya	CARYA
huckleberry	Gaylussacia	GAYLU
Indian woodoats	Chasmanthium latifolium	CHLA5
Indianpipe	Monotropa	MONOT
ironwood	Eusideroxylon	EUSID
Japanese knotweed	Polygonum cuspidatum	POCU6
jewelweed	Impatiens capensis	IMCA
lespedeza	Lespedeza	LESPE
Lichen, crustose		2LC
maidenfern	Adiantum pedatum	ADPE
mapleleaf viburnum	Viburnum acerifolium	VIAC
mayapple	Podophyllum peltatum	POPE
mockernut hickory	Carya alba	CAAL27
mountain laurel	Kalmia latifolia	KALA
mountain magnolia	Magnolia fraseri	MAFR
mountain maple	Acer spicatum	ACSP2
multiflora rose	Rosa multiflora	ROMU
navel lichen	Umbilicaria mammulata	UMMA60
New York fern	Thelypteris noveboracensis	THNO
northern red oak	Quercus rubra	QURU
northern spicebush	Lindera benzoin	LIBE3
orchardgrass	Dactylis	DACTY
pawpaw	Asimina	ASIMI
perennial grasses	unknown scientific name	UNKNOWN
pignut hickory	Carya glabra	CAGL8
pin oak	Quercus palustris	QUPA2
pitch pine	Pinus rigida	PIRI
poison ivy	Toxicodendron radicans	TORA2
post oak	Quercus stellata	QUST
poverty danthonia	Danthonia spicata	DASP2
Queen Anne's lace	Daucus carota	DACA6
rattlesnake plantain	Goodyera	GOODY
red maple	Acer rubrum	ACRU
red pine	Pinus resinosa	PIRE
reedgrass	Calamagrostis	CALAM
rhododendron	Rhododendron	RHODO
rice cutgrass	Leersia oryzoides	LEOR
river birch	Betula nigra	BENI
sassafras	Sassafras albidum	SAAL5
scarlet oak	Quercus coccinea	QUCO2
sedges	Carex	CAREX
shagbark hickory	Carya ovata	CAOV2
silver maple	Acer saccharinum	ACSA2
slippery elm	Ulmus rubra	ULRU
sourwood	Oxydendrum arboreum	OXAR
sphagnum	Sphagnum capillifolium	SPCA70
spiderwort	Tradescantia	TRADE
springbeauty	Claytonia	CLAYT
St. Johnswort	Hypericum	HYPER
stinging nettle	Urtica dioica	URDI
stinging nettle	Urtica dioica ssp. holosericea	URDIH
striped maple	Acer pensylvanicum	ACPE
sugar maple	Acer saccharum	ACSA3
sweet birch	Betula lenta	BELE
tall fescue	Lolium arundinaceum	LOAR10
thoroughwort	Eupatorium	EUPAT
tree of heaven	Ailanthus altissima	AIAL

Appendix 3.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Common Name—Continued

Local common name	Scientific name	Plant symbol
trillium	Trillium	TRILL
trout lily	Erythronium americanum	ERAM5
umbrella magnolia	Magnolia tripetala	MATR
vetch	Vicia	VICIA
Virginia creeper	Parthenocissus quinquefolia	PAQU2
Virginia pine	Pinus virginiana	PIVI2
Virginia wildrye	Elymus virginicus	ELVI3
white ash	Fraxinus americana	FRAM2
white baneberry	Actaea pachypoda	ACPA
white oak	Quercus alba	QUAL
white snakeroot	Ageratina altissima	AGAL5
wild leek	Allium tricoccum	ALTR3
willow	Salix	SALIX
woodland sunflower	Helianthus divaricatus	HEDI2
yellow buckeye	Aesculus flava	AEFL
yellow-poplar	Liriodendron tulipifera	LITU

Appendix 4.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Scientific Name

(Plants displayed occur within the National Soils Information System (NASIS) plant tables used for the soil survey area. The scientific and common names are referenced at the USDA PLANTS database: plants.usda.gov)

Local common name	Scientific name	Plant symbol
grass, annual		2GA
grass		2GP
grass, perennial		2GP
Lichen, crustose		2LC
boxelder	Acer negundo	ACNE2
white baneberry	Actaea pachypoda	ACPA
striped maple	Acer pensylvanicum	ACPE
red maple	Acer rubrum	ACRU
silver maple	Acer saccharinum	ACSA2
sugar maple	Acer saccharum	ACSA3
mountain maple	Acer spicatum	ACSP2
maidenfern	Adiantum pedatum	ADPE
yellow buckeye	Aesculus flava	AEFL
white snakeroot	Ageratina altissima	AGAL5
tree of heaven	Ailanthus altissima	AIAL
alder	Alnus	ALNUS
hazel alder	Alnus serrulata	ALSE2
wild leek	Allium tricoccum	ALTR3
common serviceberry	Amelanchier arborea	AMAR3
broomsedge bluestem	Andropogon virginicus	ANVI2
pawpaw	Asimina	ASIMI
sweet birch	Betula lenta	BELE
river birch	Betula nigra	BENI
beggarstick	Bidens	BIDEN
mockernut hickory	Carya alba	CAAL27
American hornbeam	Carpinus caroliniana	CACA18
bitternut hickory	Carya cordiformis	CACO15
fringed sedge	Carex crinita	CACR6
American chestnut	Castanea dentata	CADE12
pignut hickory	Carya glabra	CAGL8
reedgrass	Calamagrostis	CALAM
shagbark hickory	Carya ovata	CAOV2
sedges	Carex	CAREX
hickory	Carya	CARYA
blue cohosh	Caulophyllum thalictroides	CATH2
eastern redbud	Cercis canadensis	CECA4
common hackberry	Celtis occidentalis	CEOC
Indian woodoats	Chasmanthium latifolium	CHLA5
black cohosh	Cimicifuga racemosa	CIRA
springbeauty	Claytonia	CLAYT
blue mistflower	Conoclinium coelestinum	COCO13
flowering dogwood	Cornus florida	COFL2
hawthorn	Crataegus	CRATA
Queen Anne's lace	Daucus carota	DACA6
orchardgrass	Dactylis	DACTY
poverty danthonia	Danthonia spicata	DASP2
deertongue	Dichanthelium clandestinum	DICL
Canada wildrye	Elymus canadensis	ELCA4
autumn olive	Elaeagnus umbellata	ELUM
Virginia wildrye	Elymus virginicus	ELVI3
trout lily	Erythronium americanum	ERAM5
thoroughwort	Eupatorium	EUPAT
ironwood	Eusideroxylon	EUSID
American beech	Fagus grandifolia	FAGR
white ash	Fraxinus americana	FRAM2
green ash	Fraxinus pennsylvanica	FRPE
checkerberry wintergreen	Gaultheria procumbens	GAPR2

Appendix 4.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Scientific Name—Continued

Local common name	Scientific name	Plant symbol
eastern teaberry	Gaultheria procumbens	GAPR2
huckleberry	Gaylussacia	GAYLU
rattlesnake plantain	Goodyera	GOODY
Carolina silverbell	Halesia carolina	HACA3
American witchhazel	Hamamelis virginiana	HAVI4
woodland sunflower	Helianthus divaricatus	HEDI2
St. Johnswort	Hypericum	HYPER
American holly	Ilex opaca	ILOP
jewelweed	Impatiens capensis	IMCA
black walnut	Juglans nigra	JUNI
eastern redcedar	Juniperus virginiana	JUVI
mountain laurel	Kalmia latifolia	KALA
rice cutgrass	Leersia oryzoides	LEOR
lespedeza	Lespedeza	LESPE
northern spicebush	Lindera benzoin	LIBE3
yellow-poplar	Liriodendron tulipifera	LITU
tall fescue	Lolium arundinaceum	LOAR10
groundcedar	Lycopodium complanatum	LYCO3
cucumbertree	Magnolia acuminata	MAAC
mountain magnolia	Magnolia fraseri	MAFR
umbrella magnolia	Magnolia tripetala	MATR
Indianpipe	Monotropa	MONOT
blackgum	Nyssa sylvatica	NYSY
goldenrod	Oligoneuron	OLIGO3
sourwood	Oxydendrum arboreum	OXAR
American ginseng	Panax quinquefolius	PAQU
Virginia creeper	Parthenocissus quinquefolia	PAQU2
red pine	Pinus resinosa	PIRE
pitch pine	Pinus rigida	PIRI
eastern white pine	Pinus strobus	PIST
Virginia pine	Pinus virginiana	PIVI2
American sycamore	Platanus occidentalis	PLOC
Christmas fern	Polystichum acrostichoides	POAC4
Japanese knotweed	Polygonum cuspidatum	POCU6
eastern cottonwood	Populus deltoides	PODE3
mayapple	Podophyllum peltatum	POPE
black cherry	Prunus serotina	PRSE2
white oak	Quercus alba	QUAL
scarlet oak	Quercus coccinea	QUCO2
pin oak	Quercus palustris	QUPA2
chestnut oak	Quercus prinus	QUPR2
northern red oak	Quercus rubra	QURU
post oak	Quercus stellata	QUST
black oak	Quercus velutina	QUVE
alderleaf buckthorn	Rhamnus alnifolia	RHAL
rhododendron	Rhododendron	RHODO
multiflora rose	Rosa multiflora	ROMU
black locust	Robinia pseudoacacia	ROPS
blackberry	Rubus	RUBUS
bristly dewberry	Rubus hispidus	RUHI
sassafras	Sassafras albidum	SAAL5
bloodroot	Sanguinaria canadensis	SACA13
willow	Salix	SALIX
common elderberry	Sambucus nigra ssp. canadensis	SANIC4
bulrush	Scirpus	SCIRP
greenbrier	Smilax rotundifolia	SMRO
bur-reed	Sparganium	SPARG
sphagnum	Sphagnum capillifolium	SPCA70
New York fern	Thelypteris noveboracensis	THNO
American basswood	Tilia americana	TIAM
eastern poison ivy	Toxicodendron radicans	TORA2
poison ivy	Toxicodendron radicans	TORA2

Appendix 4.—Index of Common and Scientific Plant Names and Plant Symbols Sorted by Scientific Name—Continued

Local common name	Scientific name	Plant symbol
eastern poison ivy	Toxicodendron radicans ssp. radicans	TORAR
spiderwort	Tradescantia	TRADE
clover	Trifolium	TRIFO
trillium	Trillium	TRILL
eastern hemlock	Tsuga canadensis	TSCA
American elm	Ulmus americana	ULAM
slippery elm	Ulmus rubra	ULRU
navel lichen	Umbilicaria mammulata	UMMA60
perennial grasses	unknown scientific name	UNKNOWN
stinging nettle	Urtica dioica	URDI
stinging nettle	Urtica dioica ssp. holosericea	URDIH
blueberry	Vaccinium	VACCI
Blue Ridge blueberry	Vaccinium pallidum	VAPA4
mapleleaf viburnum	Viburnum acerifolium	VIAC
vetch	Vicia	VICIA
American cranberrybush	Viburnum opulus var. americanum	VIOPA2

Appendix 5.—Lab Sampled Pedons

(The pedons listed below were analyzed by the Kellogg Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska. The results of physical and chemical analyses of these pedons are available on the Internet at http://ssldata.nrcs.usda.gov/querypage.asp)

Correlated name	Pedon type	Sampled as name	User site ID	User pedon ID	Lab source	Lab pedon number
CATEACHE	TYPICAL PEDON FOR SERIES	CATEACHE	S03WV089006 CATEACHE REV	03NPSWV089006 CATEACHE	KSSL	04N0131
COOKPORT	TAXADJUNCT TO THE SERIES	COOKPORT	S06WV019002 COOKPORT	06NPSWV019002 COOKPORT	KSSL	06N0899
DEKALB	TAXADJUNCT TO THE SERIES	MATEWAN	S01WV019006 DEKALB	01NPSWV019006 DEKALB	KSSL	01N1151
GUYANDOTTE	MODAL PEDON FOR SERIES	GUYANDOTTE	S01WV081009 GUYANDOTTE	01NPSWV081009 GUYANDOTTE	KSSL	01P1145
HIGHSPLINT	MODAL PEDON FOR SERIES	HIGHSPLINT	S02WV019013 HIGHSPLINT	02NPSWV019013 HIGHSPLINT	KSSL	02N1131
LAIDIG	TAXADJUNCT TO THE SERIES	LAIDIG	S06WV019004 LAIDIG REV	06NPSWV019004 LAIDIG	KSSL	06N0901
PIPESTEM	TYPICAL PEDON FOR SERIES	SHOUNS	S03WV081001 PIPESTEM	03NPSWV081001 PIPESTEM	KSSL	04N0121

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

Nondiscrimination Statement

Nondiscrimination Policy

The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers, employees, and applicants for employment on the basis of race, color, national origin, age, disability, sex, gender identity, religion, reprisal, and, where applicable, political beliefs, marital status, familial or parental status, sexual orientation, whether all or part of an individual's income is derived from any public assistance program, or protected genetic information. The Department prohibits discrimination in employment or in any program or activity conducted or funded by the Department. (Not all prohibited bases apply to all programs and/or employment activities.)

To File an Employment Complaint

If you wish to file an employment complaint, you must contact your agency's EEO Counselor (http://directives.sc.egov.usda.gov/33081.wba) within 45 days of the date of the alleged discriminatory act, event, or personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html.

To File a Program Complaint

If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter by mail to U.S. Department of Agriculture; Director, Office of Adjudication; 1400 Independence Avenue, S.W.; Washington, D.C. 20250-9419; by fax to (202) 690-7442; or by email to program.intake@usda.gov.

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).