SOIL SURVEY

Prince Georges County Maryland

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MARYLAND AGRICULTURAL EXPERIMENT STATION

ISSUED APRIL 1967

Major fieldwork for this soil survey was done in the period 1941 to 1963. Soil names and descriptions were approved in 1965. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1965. This survey was made cooperatively by the Soil Conservation Service and the Maryland Agricultural Experiment Station; it is part of the technical assistance furnished to the Prince Georges Soil Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Prince Georges County, Maryland, contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Prince Georges County are shown on the detailed map at the back of this survey. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the survey. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit, drainage group, woodland suitability group, or any other group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their suitability or limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the discussions of capability units, woodland suitability groups, and other interpretative groupings.

Foresters and others can refer to the section "Woodlands," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Wildlife."

Community planners and others concerned with community development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Community Development."

Engineers and builders will find under "Engineering Uses of Soils" tables that give engineering descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text, depending on their particular interest.

Newcomers in Prince Georges County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County," which gives additional information about the county.

Cover picture—Aerial view of a typical housing development in Prince Georges County. Good farmland is being used rapidly to provide housing sites for a fast-growing population.

U.S. GOVERNMENT PRINTING OFFICE: 1967

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Contents

NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued April 1967

EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.
Series 1958, No. 34, Grand Traverse County, Mich.
Series 1959, No. 42, Judith Basin Area, Mont.
Series 1960, No. 31, Elbert County, Colo. (Eastern Part).
Series 1961, No. 42, Camden County, N.J.
Series 1962, No. 13, Chicot County, Ark.
Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF PRINCE GEORGES COUNTY, MARYLAND

REPORT BY ROBERT M. KIRBY, EARLE D. MATTHEWS, AND MOULTON A. BAILEY, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY M. F. HERSHBERGER, IN CHARGE, MOULTON A. BAILEY, ELVIN Z. W. COMPY, D. F. FLORA, AND ROBERT M. KIRBY, SOIL CONSERVATION SERVICE [1]

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENT STATION

PRINCE GEORGES COUNTY is in the south-central part of Maryland (fig. 1). It occupies 310,400 acres, or 485 square miles, of land and 7,000 acres of water. The Patuxent River forms the northern and eastern boundaries. Upper Marlboro, in the east-central part of the county, is the county seat, but many county functions are conducted at Hyattsville.

Maryland tobacco, type 32, is the most important farm crop. More than 68 percent of the county, or about 212,000 acres, could be cultivated, and an additional 12 percent, of about 34,500 acres, is suitable for pasture. Most of the remaining acreage is so steep, so severely eroded, or so wet that it is probably best suited as woodland, as wildlife habitats, or to recreational uses. A large part of the county, particularly the part suitable for cultivation, is in nonfarm uses.

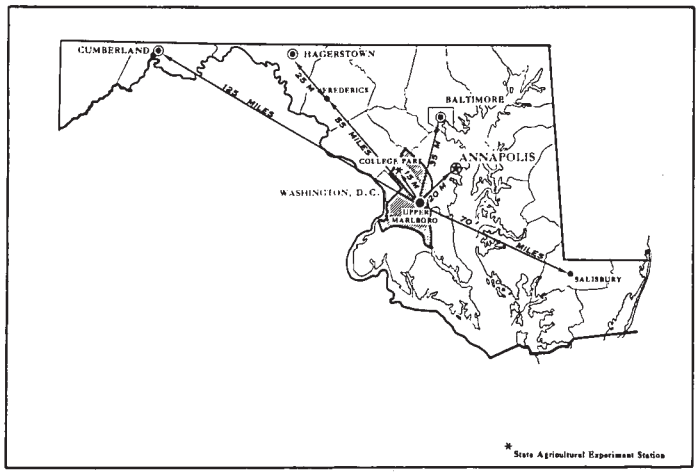

Figure 1.—**Location of Prince Georges County in Maryland.**

The population of Prince Georges County is growing fast (fig. 2). During 1964 the weekly increase in population was more than 700 persons. Because of the large nonfarm population, a special section on development of rural areas and limitations of soils for this development is included in this soil survey.

The population in 1900 was approximately 30,000; by 1940, it was about 89,500; and by 1960, it was 357,395. The official estimate of the population by the Census Bureau for 1963 was 435,000. The density of population increases as Washington, D.C., is approached. About 75 percent of the people in the county lives on about 18 percent of the land that is closest to the District of Columbia. According to the estimated rate of increase, the county will attain a population of about one million in 1973.

General Nature of the County

This section provides information for those who want a general idea of the county. The physiography, relief, and drainage of the county are briefly discussed. Also, the climate and vegetation are described, and information about industry, transportation, markets, and agriculture is given.

Physiography, Relief, and Drainage

Prince Georges County is mostly in the physiographic province called the Atlantic Coastal Plain, but a small area along the Montgomery County line is in the Piedmont province. The Piedmont is underlain by crystalline rocks of pre-Cambrian age (*2*) [2]. It is gently rolling to hilly and moderately dissected by broad, shallow valleys. The Atlantic Coastal Plain is underlain by unconsolidated deposits of gravel, sand, silt, and clay that range in age from Cretaceous in the northern part of the county to Recent on the flood plains.

The northern part of the Coastal Plain in Prince Georges County is gently rolling and has broad valleys, and the rest is a partly dissected low plateau that extends into Charles County. In the central part of the

[1] Others participating in the field survey were RICHARD H. ANDERSON, R. G. BOSTON, C. D. CROCKER, L. E. ESPY, A. P. FAUST, R. A. FOSTER, J. B. NAUROT, LEONARD S. NEWMAN, L. A. POTTER, and R. V. WRAY, Soil Conservation Service.

[2] Italic numbers in parentheses refer to Literature Cited, page 170.

Figure 2.—Left: Aerial views of an area in the eastern part of Prince Georges County. The white line extending from left-center toward the upper right is State Route 450. The double white line at the bottom is U.S. Highway No. 50. *Right:* Same area in 1963. Rapid development is continuing.

county, this plateau is nearly level to gently sloping, but near the Patuxent and Potomac Rivers, it is cut by V-shaped valleys that have short, steep slopes. Old alluvial terraces border the Patuxent and Potomac Rivers. Elevations range from sea level along the lower reaches of the major rivers to 365 feet in the northern part of the county.

About 67 percent of Prince Georges County is occupied by well drained soils; about 22 percent, by moderately well drained soils; and about 11 percent, by poorly drained and very poorly drained soils. The county has 1,204 acres of Swamp and 2,790 acres of Tidal marsh. About 28,035 acres are on the flood plains of streams.

Approximately half of Prince Georges County is drained eastward to the Patuxent River; the rest is drained southwestward through the Anacostia River and other streams to the Potomac River. The major tributaries of the Potomac River are the Anacostia River, Oxon Run, Henson Creek, Broad Creek, Piscataway Creek, Mattawoman Creek, and Zekiah Swamp. The largest of these tributaries, the Anacostia River, has tributaries of its own. The major tributaries of the Patuxent River are Western Branch, Bear Branch, Mataponi Creek, Rock Branch, and Swanson Creek. Western Branch is the largest of these tributaries.

All the major streams in the county are normally sluggish, and most are in broad valleys. Many of these streams have large accumulations of silt. The estuaries of streams in the southern part of the county are tidal where they flow into the Patuxent and Potomac Rivers.

Climate [3]

Prince Georges County has a humid, temperate, semicontinental climate. Winters are generally mild, and summers are warm and moist. Spring and fall are the most pleasant seasons.

Most of the weather systems move from west to east through the county. Generally dominant in summer is warm, moist air that moves up from the Gulf of Mexico. Cold, dry air from the central part of Canada is dominant in winter, but it has been somewhat moderated in passing over the Appalachian Mountains. The influence of the nearby Atlantic Ocean is felt in summer when easterly winds occasionally bring cooler air over the hot land. This influence is also felt in cooler seasons. Raw, uncomfortable weather and much of the precipitation in winter are brought in by on-shore winds (northeasters) that are ahead of low-pressure systems moving northward along the coast.

A summary of temperature and precipitation data from the Glenn Dale Bell weather station is given in table 1. Also listed in this table are heating degree-days.

[3] By W. J. Moyer, State climatologist, Environmental Science Services Administration, Weather Bureau, U.S. Department of Commerce.

TABLE 1.—*Temperature and precipitation at Glenn Dale Bell station* [1]

[Elevation 151 feet]

Month	Temperature				Heating degree days	Precipitation							
	Average daily		Two years in 10 will have at least 4 days with—			Average	One year in 10 will have—		Snow, sleet, and hail				
	Maximum	Minimum	Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—	Base 65°F.		Less than—	More than—	Average	Maximum monthly	Year	Maximum daily	Year
	°F.	°F.	°F.	°F.		Inches	Inches	Inches	Inches	Inches		Inches	
January	45.7	24.5	65	6	927	3.43	1.9	5.9	5.0	30.5	1922	24.0	1922
February	47.6	24.2	67	10	815	2.83	1.5	3.9	5.8	21.7	1934	14.0	1958
March	55.9	30.5	77	15	676	3.84	1.5	5.9	4.8	20.8	1960	19.0	1942
April	67.7	40.6	85	27	339	3.54	1.4	6.0	.1	8.0	1924	8.0	1924
May	77.2	50.4	89	35	99	4.23	1.3	7.0	0	0	-------	0	-------
June	84.8	59.2	93	46	0	4.00	1.7	6.6	0	0	-------	0	-------
July	87.8	63.6	96	53	0	4.69	1.9	8.1	0	0	-------	0	-------
August	86.5	62.0	95	50	0	5.07	1.3	10.0	0	0	-------	0	-------
September	80.7	54.6	92	39	48	3.86	.7	7.6	0	0	-------	0	-------
October	69.4	43.5	85	29	270	3.36	.7	7.2	(2)	3.0	1925	2.0	[3] 1940
November	58.4	33.3	74	20	573	3.22	.9	6.1	.7	7.3	1938	7.0	1938
December	46.7	24.9	65	8	899	2.97	1.5	5.1	4.0	15.0	1932	10.5	1957
Year	67.4	42.6	----------	----------	4,646	45.04	34.9	55.7	20.4	30.5	1922	24.0	1922

[1] Record for the period 1945–60. [2] Trace. [3] Also occurs on earlier dates.

Heating degree-days are computed by recording for each day the significant mean departure from a selected temperature base, and adding these departures for the month and for the year. The purpose of the computation is to determine positive or negative departures from a selected base temperature. A base of 65° F. is used for heating degree-days, for this is the lowest mean daily temperature at which no heat is required in homes. To get the departure for one day, the actual mean temperature, if less than 65°, is subtracted from 65°. For example, a day with a mean temperature of 55° has a value of 10 heating degree-days. In contrast, a day with a mean temperature of 65° or more has no heating degree-days because no heat is required. Heating degree-days are useful in calculating the amount of fuel needed in an average year and in comparing a particular season with the average.

The mean temperature at Glenn Dale and Cheltenham is about 55° F. The hottest period of the year is the latter half of July when the maximum afternoon temperatures average about 88°. The highest temperature recorded in the county was 107° at College Park on July 20, 1930. The coldest period of the year is the latter part of January and the early part of February, when the minimum temperatures average about 25°. The coldest temperature recorded was −26° on January 14, 1912, also at College Park.

Table 2 gives the average dates of the last occurrences of specified freezing temperatures in spring and the first in fall and the mean number of days between these dates. The data are given for four weather stations in the county. These data show that the climate in the county varies considerably. The local variations in topography greatly influence the variations in temperature.

The annual precipitation in the county averages 45 inches, but extremes range from less than 18 to more than 60 inches. In general, precipitation is fairly evenly distributed throughout the year. It ranges from 3 to 4 inches per month for most of the year but increases to 4 or 5 inches per month from May to September. August has the greatest monthly precipitation. Although measurable amounts of precipitation fall on about one-third of the days each year, useful amounts fall less frequently. One-tenth of an inch of rain was recorded on 74 to 80 days during the year.

The precipitation may be heavy in any month, but it varies more in summer. During the hurricane Connie, in August 1955, a rainfall of 6.98 inches was recorded at the Glenn Daile Bell station, 7.86 inches in Greenbelt, and 9.54 inches in Cheltenham. In summer, precipitation occurs in showers and thunderstorms in which rainfall varies within small areas. Commonly, 1 to 3 inches of rain falls in one locality but only a sprinkle just a few miles away. In winter, precipitation usually occurs in general storms, which cover large areas.

Drought may occur in any months but a serious drought is most likely in summer. Generally, the rainfall and the moisture stored in the soil are adequate for favorable crop yields. At times, however, irrigation would increase yields because showers are distributed unequally in summer, dry periods occasionally occur at critical stages of plant growth, and in summer the rate of evaporation is high. In 1930, the driest year recorded in the county, there was only 17.98 inches of precipitation at the Glenn Dale Bell station and 22.58 inches at Cheltenham.

TABLE 2.—*Probable dates of last specified freezing temperatures in spring and first in fall at four stations*

Temperature	Last occurrence in spring	First occurrence in fall	Number of days between dates
CHELTENHAM			
32°	April 21	October 19	181
28°	April 8	November 3	209
24°	March 18	November 16	243
20°	February 22	December 8	289
16°	February 9	December 20	314
COLLEGE PARK			
32°	April 29	October 15	168
28°	April 15	October 26	194
24°	March 24	November 13	234
20°	March 6	November 30	269
16°	February 14	December 16	305
GLENN DALE BELL			
32°	May 4	October 11	160
28°	April 21	October 21	183
24°	April 5	November 2	212
20°	March 23	November 16	238
16°	March 9	November 28	264
LAUREL (3 miles west)			
32°	April 20	October 21	184
28°	April 8	November 2	208
24°	March 20	November 21	246
20°	March 15	December 1	261
16°	March 3	December 11	283

The average annual snowfall is 19 to 20 inches, but snowfall varies considerably from year to year. In a 55-year period at Cheltenham, the lowest annual snowfall was 2.0 inches in the winter of 1949–50, and the highest was 48.3 inches in 1939–40. The range at the Glenn Dale Bell station for a 42-year period was from 2.0 inches in the winter of 1949–50 to 52.8 inches in 1957–58. The greatest single snowfall, which occurred on January 28 and 29, 1922, ranged from 22 to 28 inches throughout the county. A snowfall of this depth is rare, but 10 inches of snow or more accumulate once in every 5 or 6 years.

Thunderstorms occur on an average of 30 to 35 days each year. Two-thirds of these storms occur in the period from June through August. Occasionally local damage is caused by lightning, wind, hail, or flooding. Hail falls during these storms only once or twice a year.

Tornadoes are infrequent and have caused little damage. The effects of hurricanes are felt in the county about once a year, usually in August or September. Most hurricanes do not pass close enough to the county to cause more than minor damage, but occasionally one passes nearby, and strong winds, heavy rains, and flooding cause great damage.

The prevailing winds are from the northwest, except from May through September, when warm south or southwest winds blow from high-pressure systems that are centered to the east or southeast of the county. The average annual velocity of wind is between 8 and 10 miles per hour, but winds of 60 miles per hour or higher sometimes accompany severe thunderstorms or hurricanes in summer or general storms in winter.

The relative humidity is lowest from February through April and highest from July through September. Normally, the daily humidity is highest near sunrise and is lowest in midafternoon. Dense fog occurs on about 11 days of each year.

Vegetation

Before the area that is now Prince Georges County was settled by colonists, it probably was almost entirely covered by hardwoods. The dominant trees were probably red and white oaks, sweetgum, and yellow-poplar. About 60 percent of the county still has woodland cover, but there have been many changes in the distribution of the species. The most noticeable change has been the invasion of cleared and cutover areas by conifers, especially Virginia pine, but shortleaf pine and some loblolly pine also have invaded many areas. Many sandy areas are now occupied by scrub growth of many species, dominantly Virginia pine and Maryland, or blackjack, oak (*Quercus marilandica*).

The areas of Tidal marsh support coarse grasses and rushes. Growing in some areas are shrubs and small trees that tolerate salt, or at least brackish, water.

Industries, Transportation, and Markets

A large number of people are employed at Federal installations within the county. In 1964 there were 90 private industries in the county that employed 20 or more people each. Of these, 20 had 100 or more employees each. Also, there were 24 private research facilities, mainly electronic, chemical, optical, aviation and space, and engineering. The most prominent kinds of industries were printing and publishing; chemicals, drugs, and industrial gases; food processing; electronic and electrical products; mineral pigments; and building materials, including sand and gravel.

Main lines of the Pennsylvania and the Baltimore and Ohio Railroads run through Prince Georges County, and five other rail lines run from the District of Columbia to other parts of the county. Three major commercial airports are close to the county. Six small commercial airfields in the county accommodate small planes. Nearly every farm has a paved access road.

Because of its location, Prince Georges County has many markets. Most of the tobacco, the most important farm product, is marketed at Upper Marlboro.

Higher Education

Prince Georges County has three institutions of higher learning, namely, the University of Maryland, Maryland State Teachers College at Bowie, and Prince Georges Junior College.

Agriculture

Early settlers cleared the soil so that they could plant corn, small grain, tobacco, and hay. Tobacco soon became the principal cash crop, and today farming in Prince

Georges County is based on tobacco. For many years, pasture and hay were important as roughage for draft animals and cattle, but the importance of forage crops and pasture declined as farming became mechanized. A small market for hay is provided by the four race tracks in the county.

Farms in the county have decreased in number but have increased in size. In 1954 there were 1,786 farms in the county. They averaged 89.4 acres in size. According to the Census of Agriculture, the number of farms in the county decreased from 1,786 in 1954 to 1,251 in 1959, but increased from an average size of 89.4 acres to 99.4 acres in the same period.

Of the 1,251 farms reported in 1959, 255 were less than 10 acres in size, 401 were 10 to 49 acres, 356 were 50 to 139 acres, and 209 were 140 to 499 acres. Only 30 farms were 500 acres or more in size.

Tobacco was planted on 8,783 acres in 1959. By acreage, and particularly by value of the crop, tobacco ranked first as a farm product, in Prince Georges County. The county ranked first in the State in acreage planted to tobacco, and second in production. In addition, 8,642 acres were in corn, 7,388 acres in hay, 2,405 acres in wheat, 2,024 acres in soybeans, and 740 acres in vegetables, including sweetpotatoes and Irish potatoes. Also produced in the county were nursery and greenhouse products that sold for almost $1 million.

Some livestock is produced, but the county is not nearly self-sufficient in livestock products. In 1959 there were 8,393 cattle and calves, of which only 1,337 were milk cows. Nearly all of the milk consumed in the county is produced elsewhere. About 9,200 hogs, 24,000 chickens, 320,000 dozens of eggs, and 8,000 turkeys were sold from farms.

In Prince Georges County, the area planted to tobacco has decreased from 12,384 acres in 1954 to 8,783 acres in 1959. In that period yields decreased from more than 9 1/2 million pounds to slightly more than 7 million pounds. This reduction was largely the result of farmland being used for housing developments, shopping centers, and for military and other government installations. Although land use has changed, tobacco is still of great economic importance to the county.

The sandy soils of the Collington, Sassafras, Marr, and Westphalia series are among the best soils in the State for growing tobacco of high quality. Primarily because cultural practices have improved, the average yield of tobacco has increased 14 pounds per acre for each year in the past 10 years, and the percentage of high-quality leaf in a normal year has increased from about 15 percent to about 25 percent of the total crop.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Prince Georges County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

In Prince Georges County, soil association 1 is in the Piedmont province; soil associations 4, 9, and 10 are in the Coastal Plain uplands; soil association 6 is on terraces along the Potomac River; association 8 is on terraces along the Patuxent River; and association 5 is on flood plains and in tidal marshes. In soil associations, 2, 3, and 7, the soils have a compact subsoil, substratum, or both, at least in some places. In soil associations 4, 8, 9, and 10, most of the soils have a fairly friable subsoil and a friable to loose substratum. In soil association 1, the soils are only a few feet deep to bedrock, but in all the other associations bedrock is at great or indefinite depth.

1. Manor-Glenelg association: Deep, well-drained and somewhat excessively drained, nearly level to very steep soils of the Piedmont province

This association consists of the soils that developed over bedrock. The association occurs mainly in a small area in the extreme northern tip of the county. The Manor soils occupy about 75 percent of each of these areas, and the Glenelg and minor soils occupy about 25 percent. This association makes up less than 1 percent of the county.

The sloping to very steep Manor soils are very deep to bedrock. They have almost uniform texture throughout their profile and are somewhat excessively drained. Manor soils developed in materials that weathered in place from fairly soft to moderately hard, highly micaceous rock. The Glenelg soils are deep and well drained. They occupy nearly level to strongly sloping uplands and are underlain by crystalline rock that generally contains fairly large amounts of mica.

The minor soils in this association are the moderately well drained Codorus soils and the poorly drained Hatboro.

General farming that emphasizes the raising of beef cattle is the dominant type of agriculture. Some small areas remain in woods, but most areas have been developed for residential, commercial, or industrial use.

Generally, this association is well suited to residential, commercial, and industrial development. On slopes of more than about 8 percent, however, effluent from septic tanks is likely to seep to the surface downslope from the tanks. If community systems for disposing of sewage are installed, these soils have no limitation to residential development except those caused by slope.

2. Beltsville-Leonardtown-Chillum association: Moderately deep, well-drained to poorly drained, dominantly gently sloping soils that have a compact subsoil or substratum

This association is on the nearly level to gentle slopes at the highest elevations. The Beltsville soils make up about 45 percent of the association; the Leonardtown soils, about 13 percent; and the Chillum and minor soils, about 42 percent. This association occupies about 16 percent of the county.

The Beltsville soils are gently sloping to moderately sloping in most places, but some areas are nearly level and others are fairly steep. These soils are moderately

well drained and generally silty. Because of their dense, almost impermeable subsoil, they have a seasonally perched water table that limits their use for farming. The poorly drained Leonardtown soils occupy flats and depressions throughout the association. Like the Beltsville soils, the Leonardtown soils have a dense, almost impermeable subsoil that limits their effective depth so much that only shallow or moderately deep rooted crops are suitable. The Chillum soils are moderately deep and well drained. They developed in a thin, silty to somewhat sandy mantle of wind-deposited material over a substratum consisting of older sandy and gravelly material that is hard or compact.

Included with the major soils are scattered areas of the well drained Sassafras soils, the somewhat excessively drained Croom soils, the moderately well drained Woodstown soils, the poorly drained Fallsington and Elkton soils, and extensive areas of Sandy and clayey lands.

The major soils of this association are used for general farming. Although the use of these soils is limited by depth, drainage, or both, crops on them respond well to heavy fertilization and other good management. Tobacco production is limited on most of these soils. Under appropriate management, however, good pasture and hay are produced, and there are some good livestock farms.

Much of this association lies near the District of Columbia and is undergoing rapid residential and some industrial development. For residential development, a community system for disposing of sewage is required in most places. Individual septic tanks do not function properly on the soils having impeded drainage, and these tanks may be unreliable on the Chillum soils or other well-drained soils having a compact substratum. Some seasonal ponding may be expected on the poorly drained Leonardtown soils. Generally, this association is suitable for parks, playgrounds, picnic sites, and other outdoor areas that are used in warm weather.

3. Christiana-Sunnyside-Beltsville association: Deep, level to steep, well drained, sandy and clayey soils and level to sloping, moderately deep, moderately well drained soils that have a compact subsoil

This association is in the northern part of the county. It adjoins the District of Columbia on the west and the flood plain of the Patuxent River on the east. The Christiana soils make up about 26 percent of the association; the Sunnyside soils, about 20 percent; the Beltsville soils, about 20 percent; and minor soils, about 34 percent. This association occupies about 15 percent of the county.

In this association the underlying material is dominantly red clay. The Christiana soils formed on this material. Along with the Christiana soils, and on essentially the same kind of clay, are small areas of the somewhat excessively drained Muirkirk soils. The Christiana soils are red, deep, and well drained, but moisture moves slowly through them. The Sunnyside soils are also red, deep, and well drained, but they have a less clayey, more permeable subsoil than the Christiana soils. The moderately well drained Beltsville soils have a dense, almost impermeable subsoil.

Locally important minor soils in this association are the somewhat excessively drained Galestown and Evesboro soils, the well drained Sassafras soils, the moderately well drained Keyport and Woodstown soils, and the poorly drained Elkton and Fallsington soils.

Except at the U.S. Department of Agriculture Research Center at Beltsville, little of this association is used for farming. Much of it is in second-growth hardwoods and pines at various stages of maturity. Most of the soils are not naturally fertile, but crops on them respond fairly well to good management, including heavy fertilization. When the Beltsville and Christiana soils are either very wet or very dry, they are difficult to work with most farm machinery. The Christiana and Sunnyside soils are suited to deep-rooted crops, but the choice of crops for the Beltsville soils is limited by the fragipan, or hardpan, at a moderate depth.

Because this association lies between Washington, D.C., and Baltimore, Md., much of it has been used for residential and industrial development. This development is limited on the Sunnyside soils only in those areas where slopes are strong or steep. Septic tanks do not function well on the Christiana soils, however, and they function hardly at all on the Beltsville soils. Other residential uses are also severely limited on the Christiana soils by their clay subsoil. The Christiana soils, as well as the minor Muirkirk soils and Silty and clayey lands, are unstable when they are saturated, especially if their soil material has been moved, graded, or otherwise disturbed. These soils tend to cave, slump, and flow when they are wet or are under the load of buildings, roads, or other structures. Upon drying the soil material may shrink away from footings and foundations. On-site engineering surveys and studies should be made where heavy permanent installations are proposed on the soils of this association.

4. Collington-Adelphia-Monmouth association: Deep, nearly level to strongly sloping, well drained and moderately well drained soils of the uplands that developed in sediments containing glauconite

This association is in a single area slightly north of the central part of the county. It extends from the Patuxent River on the east to the southeastern corner of the District of Columbia. The Collington soils make up about 60 percent of the association; the Adelphia soils about 20 percent; and the Monmouth and minor soils, about 20 percent. The association occupies about 11 percent of the county.

The dominant Collington soils have a sandy substratum, are well drained, and occupy most of the higher elevations and stronger slopes of the association. The moderately well drained Adelphia soils are similar to the Collington soils but have a fluctuating water table and occur mostly on foot slopes. The well-drained Monmouth soils are much like the Collington soils, but they have a finer textured, stickier subsoil and contain more glauconite, or greensand.

Some of the minor soils in this association are the moderately well drained Donlonton soils and the poorly drained Shrewsbury and Colemantown soils.

The soils of this association are among the most productive in Prince Georges County. They are well suited to hay, pasture, and orchards, and to row crops if they are cultivated on the contour. Under good management, most of the well-drained soils produce favorable yields of high-quality tobacco.

The amount of farmland in this association has been reduced several thousand acres by residential expansion (see fig. 2). The well-drained soils have few limitations for residential development.

5. Bibb-Tidal marsh association: Poorly drained soils of the flood plains and soils in marshes that are subject to tidal flooding

This association is along the larger streams of the county that flow to tidal areas of the Potomac and Patuxent Rivers. The association is made up mostly of alluvial soils of the flood plains. In the northern part of the association, these soils contain much micaceous material, and in the southern part they consist entirely of Coastal Plain sediments and contain little mica. These soils are mainly the poorly drained Bibb and the moderately well drained Codorus soils, but the poorly drained Hatboro soils, and the very poorly drained Johnston soils also occur. The tidal marshes are along the Potomac and Patuxent Rivers and along the lower reaches of streams that empty into them. The soils of the flood plains occupy about 82 percent of the association, and tidal marshes and minor soils occupy the rest. The association makes up about 11 percent of the county.

Most of the acreage in alluvial soils has only limited use for farming because it is subject to frequent or seasonal flooding. Some small areas are used for pasture, though most of the acreage is wooded and suitable as wildlife habitats. All areas of Tidal marsh are wet, unstable, and subject to daily flooding by brackish to saline water. The soil material in these marshes has been recently deposited. The marshes are of no use for farming, but most areas are covered with native grasses and herbs that give some protection to wildlife, particularly to birds using them as seasonal havens.

Minor soils in the association are the moderately well drained Adelphia, Mattapex, and Woodstown soils and the poorly drained Colemantown and Othello soils.

The use of this association for residential or industrial expansion is very severely limited, but many areas can be used for recreational purposes.

6. Sassafras-Keyport-Elkton association: Nearly level to strongly sloping, well-drained to poorly drained soils on terraces along the Potomac River

This association occupies three small areas on the lower terraces of the Potomac River south of the District of Columbia. The northern area is dominated by the deep, well drained, sandy Sassafras soils; the middle area, by the deep, moderately well drained, silty Keyport soils; and the southern area, by the poorly drained, silty Elkton soils. Sassafras soils occupy about 30 percent of the total area of this association; Keyport soils, about 20 percent; and Elkton and some minor soils, about 50 percent. This association makes up about 1 percent of the county.

The Sassafras and Keyport soils are on nearly level to gentle slopes, and the Elkton soils are mainly on low-lying flats. The Sassafras soils are underlain by loose sand, and the Keyport and Elkton soils are underlain by thick beds of silty clay.

Some of this association is used for crops, but fairly large areas are wooded. The Sassafras soils are used for vegetables and grain, and the Keyport and Elkton soils are used chiefly for hay and pasture. Crops on the Sassafras, Keyport, and Elkton soils respond well to good management, including fertilization. Some artificial drainage is required on the Keyport and Elkton soils if they are to be cropped efficiently.

This association lies within the expanding Washington area. Much of it has been developed for residential use, though intensive development has been limited because the Keyport and Elkton soils are poorly suited for disposing of effluent from septic tanks. As the water and sewerage facilities are extended into this association, most of it probably will be used for residential development.

7. Sassafras-Croom association: Gently sloping to steep, well-drained, dominantly gravelly soils, some of them with a compact subsoil and substratum

Most of this association is in the southern part of the county, southeast of the District of Columbia, but small areas are in the northeastern part near Bowie and in the southeastern part adjoining Charles County. This association is characterized by gentle slopes and short steep slopes. On and in the soils are concentrations of smooth, rounded gravel. The major soils formed in sandy and clayey, very gravelly deltaic materials that were carried down the larger rivers during Pleistocene time and were deposited on what is now the Coastal Plain. These materials are covered locally by a silty mantle similar to that on the soils of the Beltsville-Leonardtown-Chillum association. The Sassafras soils occupy about 30 percent of this association; the Croom soils, about 25 percent; and minor soils, about 45 percent. This association makes up about 22 percent of the county. The Sassafras soils are deep and well drained. They are severely eroded on many of the steeper slopes. The Croom soils are shallow and somewhat excessively drained. They have a very compact to cemented subsoil and substratum and a large percentage of gravel throughout.

Some of the minor soils in this association are the excessively drained to somewhat excessively drained Galestown and Evesboro soils, the moderately well drained Aura soils, the deep, well drained Magnolia and Collington soils, and the moderately well drained Beltsville and Woodstown soils.

Some of this association is used for general farming, but tobacco is the most important single crop. Although yields of tobacco are not high, quality is normally very good or excellent. Most of the steeper areas are in second-growth scrub trees. The soils are not naturally fertile, but crops on them respond well to management, including fertilization. In summer, crops may be severely damaged during prolonged periods of dry weather.

Most of this association is directly in the path of the rapidly expanding Washington area, and many areas have been used for residential expansion. The Sassafras soils, except those on steep slopes, have few limitations to such expansion. Even on the gentle slopes, however, the Croom soils and the similar Aura soils have severe limitations as sites for installing septic tanks. On slopes of more than 10 percent even the best soils should not be used for septic tanks, because there is danger of seepage and pollution downslope.

8. Collington-Matapeake-Galestown association: Deep, well-drained to excessively drained, nearly level to strongly sloping soils on terraces along the Patuxent River

This association is along the Patuxent River (fig. 3) in five areas that are separated by alluvial soils and tidal

217-092—67——2

Figure 3.—**Collington fine sandy loam, 0 to 2 percent slopes, in the Collington-Matapeake-Galestown association on a terrace of the Patuxent River near Nottingham. Much of this association consists of soils of Class I and is suitable for intensive cultivation.**

marshes. The Collington soils occupy about 30 percent of the association; the Matapeake soils, about 30 percent; and the Galestown and minor soils, about 40 percent. The association makes up about 2 percent of the county.

The deep, well-drained Collington soils formed in glauconitic materials locally called greensand. The deep, well-drained Matapeake soils formed in beds of silt and very fine sand that overlie older deposits of sandy and some gravelly materials. The Matapeake soils are most common near Nottingham. The Galestown soils are very deep and somewhat excessively drained and excessively drained. They formed in loose sandy materials that lie in thick beds along the Patuxent River and other large streams.

The minor soils in this association are the well drained Sassafras soils, the moderately well drained Adelphia, Mattapex, and Klej soils, and the poorly drained Fallsington and Shrewsbury soils.

Except for the droughty Galestown soils, the major soils of this association are among the most productive in the county. They are well suited to hay, pasture, orchards, and row crops. Some of the soils produce favorable yields of high-quality tobacco.

The major soils of this association have few limitations as sites for residential expansion. The association is isolated from Washington, except for the northernmost part near State Route 214.

9. Westphalia-Marr-Howell association: Deep, well-drained, nearly level to strongly sloping soils of the uplands

This association consists of two areas in the eastern part of the county that extend northward from Upper Marlboro, the county seat. The soils of the association formed in the fine sand, silt, and clay of Miocene age. About 50 percent of the association is Westphalia soils; about 30 percent, Marr soils; and about 20 percent, Howell soils and minor soils. This association makes up about 4 percent of the county. A typical landscape is shown in figure 4.

The major soils in this association, the Westphalia, Marr, and Howell are deep and well drained. The Westphalia soils developed in thick beds consisting of fine and very fine sand and small amounts of silt and clay. Some areas of Westphalia soils are nearly level, but most are gently sloping. The Marr soils have a thicker, more strongly expressed subsoil than the Westphalia soils and are nearly level to moderately sloping. The Howell soils developed in beds of fine silt and clay, and their subsoil has moderate to moderately slow permeability. The Howell soils are nearly level to strongly sloping.

Minor soils in this association are the moderately well drained Adelphia soils and the poorly drained Shrewsbury.

The soils in this association have been intensively cultivated, some areas since the early part of the seventeenth century. Consequently, at least half of the acreage is severely damaged by erosion and is of limited use for farming, particularly for the production of tilled crops. The major soils are used for general farming but are limited for this use by slopes and erosion. Crops on these soils respond well to good management, including fertilization. The Westphalia and Marr soils produce tobacco of high quality, and if management is good, the Marr soils produce favorable yields. The tobacco produced on the Howell soils may not be of so high quality as that produced on the Westphalia and Marr soils.

Strong slopes cause some limitations, particularly to safe functioning of septic tanks, but the major soils of this association are otherwise suitable for residential expansion. Because the subsoil and substratum of the Howell soils are clayey, large dispersion fields are needed if septic tanks are installed.

10. Westphalia-Evesboro-Sassafras association: Deep, well-drained to excessively drained soils of uplands that are mostly moderately sloping to steep

This association occupies a large area that extends from the central part of the county to the extreme southeastern corner and is dissected by many small streams and drainageways. It is characterized by rounded knolls, by some small mature valleys, and by many younger, steep-walled, V-shaped valleys. The major soils formed in somewhat silty and clayey sand of Miocene age that has been covered in places by coarser sand and by gravel. In many places geologic and accelerated erosion have moved the coarser material down the slopes and have deposited these materials in layers of varying thickness on the floors of older valleys. This erosion has exposed the finer Miocene materials at intermediate and high elevations. About 35 percent of this association is made up of Westphalia soils; about 20 percent, Evesboro soils; and about 45 percent, Sassafras and minor soils. The association occupies about 17 percent of the county.

The Westphalia soils are deep and well drained. They formed in fine and very fine Miocene sand and are relatively free of gravelly materials. Evesboro soils are very deep, sandy, and droughty. They formed in the loose, gravelly sand that caps the knolls and some of the upper steep slopes. Sassafras soils are also deep and well drained. They developed in materials that are similar to those of the Evesboro soils but that contain somewhat more silt and clay. The Sassafras soils have a thicker and more strongly expressed subsoil than the Westphalia soils. In this association most areas of Sassafras soils are gravelly.

Figure 4.—**The irregular, level to strongly sloping topography of the Westphalia-Marr-Howell association in the east-central part of the county.**

Some of the minor soils in this association are the somewhat excessively drained and excessively drained Galestown and Rumford soils, the well drained Marr and Howell soils, the moderately well drained Adelphia and Woodstown soils, and the poorly drained Fallsington soils.

The soils of this association are used to produce tobacco and, as a supplement to that use, for general farming. Erosion has been extensive and severe in the association, and in many places subsoil material is exposed on the steeper slopes. Locally, there are many gullies. Because the major soils are sandy, gravelly, or both, they are somewhat droughty in summer. During extended dry periods, yields may be very low. If moisture is adequate, crops on these soils respond to fertilization and other good management. Tobacco of fine quality is produced, though yields are not so high as those on finer textured soils that have higher moisture capacity.

This association has not been extensively developed for residential use, and the soils have some limitation for such use. In designing footings and foundations, it must be taken into account that the Westphalia soils, and to some degree the Evesboro, are rather unstable on the steeper slopes. Septic tanks are not suitable on slopes of more than 8 percent, because seepage and pollution downslope are likely. Since excess water is not a problem on the major soils, foundations and basements are nearly always dry. Especially on the stronger slopes, establishing and maintaining lawns and other protective, stabilizing vegetation may be difficult.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Prince Georges County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. For successful use of this survey, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Beltsville and Sassafras, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the natural landscape. Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Beltsville fine sandy loam and Beltsville silt loam are two soil types in the Beltsville series. The difference in texture of their surface layers is apparent from their names.

Some types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Beltsville fine sandy loam, 0 to 2 percent slopes, is one of several phases of Beltsville fine sandy loam, a soil type that ranges from nearly level to moderately steep.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing soil boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Rumford-Evesboro loamy sands. The soil scientist may also show as one mapping unit two or more soils if the differences between them are so small that they do not justify separation for the purpose of the survey. Such a mapping unit is called an undifferentiated soil group; for example, Plummer and Rutlege loamy sands. Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Clay pits or Gravel and borrow pits, and are called land types rather than soils.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey. On the basis of yield and practice tables and other data, the soil scientists set up trial groups, and then test them by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

Descriptions of the Soils

In this section each soil series (group of soils) represented in the county is described in alphabetic order, and each series is followed by descriptions of the soils in the series. These are the soils that were mapped in the county and are shown on the large map at the back of the survey. In alphabetic order with the series, the miscellaneous land types (not true soils) in the county are also described. The approximate acreage and proportionate extent of the soils and land types are given in table 3.

The descriptions of each soil series includes, in fine print, a profile typical of the series. A profile is a record of what the soil scientist saw when he dug into the ground. Those who want only a working knowledge of the soils can omit reading the fine print. But reading the larger print of the series description should not be omitted, because it tells about important characteristics common to all the soils in the series but not included in the descriptions of the single soils.

In describing the soils, the scientist frequently assigns a letter symbol, for example, "A1," to the various layers. These symbols have special meanings that concern scientists and others who make a special study of soils. Most readers need to remember only that all symbols beginning with "A" refer to the surface soil and subsurface soil; those beginning with "B" refer to subsoil; and those beginning with "C" refer to substratum, or parent material. It may be helpful to remember that the small letter "p" indicates a plowed layer and that the small letter "t" indicates an accumulation of clay.

Soil scientists use Munsell notations to indicate the color of a soil precisely, and they provide an equivalent term in words for those not familiar with the Munsell system, for example, "dark brown (10YR 3/3)." Terms such as "fine sandy loam" are used to describe the texture of the soil, which is the content of sand, silt, and clay. The words "weak, fine, granular" and similar words describe kinds of structure, or the way the individual soil particles are arranged in larger grains, or aggregates, and the amount of pore space between the grains. Consistence is described by words such as "hard, friable, plastic". The first word is for a dry soil, the second moist, and the third wet.

These and other terms are defined in the Glossary at the back of the report and in the "Soil Survey Manual" (*5*).

TABLE 3.—*Approximate acreage and proportionate extent of the soils*

Map symbol	Soil	Area	Extent	Map symbol	Soil	Area	Extent
		Acres	*Percent*			*Acres*	*Percent*
AdA	Adelphia fine sandy loam, 0 to 2 percent slopes	1, 942	0. 6	AuC3	Aura gravelly loam, 6 to 12 percent slopes, severely eroded	525	0. 2
AdB2	Adelphia fine sandy loam, 2 to 5 percent slopes, moderately eroded	2, 110	. 7	AuD	Aura gravelly loam, 12 to 20 percent slopes	1, 796	. 6
AdC2	Adelphia fine sandy loam, 5 to 10 percent slopes, moderately eroded	167	. 1	AvE	Aura and Croom gravelly loams, 20 to 50 percent slopes	9, 279	3. 0
AhA	Adelphia silt loam, 0 to 2 percent slopes	616	. 2	BeA	Beltsville fine sandy loam, 0 to 2 percent slopes	321	. 1
AhB2	Adelphia silt loam, 2 to 5 percent slopes, moderately eroded	271	. 1	BeB2	Beltsville fine sandy loam, 2 to 5 percent slopes, moderately eroded	1, 832	. 6
AuB2	Aura gravelly loam, 2 to 6 percent slopes, moderately eroded	219	. 1	BeC2	Beltsville fine sandy loam, 5 to 10 percent slopes, moderately eroded	691	. 2
AuC2	Aura gravelly loam, 6 to 12 percent slopes, moderately eroded	696	. 2	BlA	Beltsville silt loam, 0 to 2 percent slopes	5, 178	1. 7

TABLE 3.—*Approximate acreage and proportionate extent of the soils*—Continued

Map symbol	Soil	Area	Extent
		Acres	*Percent*
BlB2	Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	17, 463	5. 6
BlC2	Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	1, 811	. 6
BlC3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded	975	. 3
BlD3	Beltsville silt loam, 10 to 15 percent slopes, severely eroded	440	. 1
BmB	Beltsville-Urban land complex, 0 to 5 percent slopes	3, 867	1. 2
BmC	Beltsville-Urban land complex, 5 to 15 percent slopes	366	. 1
Bn	Bibb sandy loam	1, 910	. 6
Bo	Bibb silt loam	17, 300	5. 6
Br	Bibb-Urban land complex	739	. 2
BtB2	Butlertown silt loam, 0 to 5 percent slopes, moderately eroded	263	. 1
CaB2	Chillum silt loam, 0 to 6 percent slopes, moderately eroded	1, 785	. 6
CaC2	Chillum silt loam, 6 to 12 percent slopes, moderately eroded	911	. 3
CaC3	Chillum silt loam, 6 to 12 percent slopes, severely eroded	495	. 2
CaD2	Chillum silt loam, 12 to 20 percent slopes, moderately eroded	456	. 1
CbB	Chillum-Urban land complex, 0 to 6 percent slopes	360	. 1
CbC	Chillum-Urban land complex, 6 to 12 percent slopes	198	. 1
CbE	Chillum-Urban land complex, 12 to 35 percent slopes	180	. 1
CcC3	Christiana clay, 5 to 10 percent slopes, severely eroded	604	. 2
CcD3	Christiana clay, 10 to 15 percent slopes, severely eroded	263	. 1
CcE3	Christiana clay, 15 to 35 percent slopes, severely eroded	246	. 1
CdA	Christiana fine sandy loam, 0 to 2 percent slopes	133	(1)
CdB2	Christiana fine sandy loam, 2 to 5 percent slopes, moderately eroded	911	. 3
CdC2	Christiana fine sandy loam, 5 to 10 percent slopes, moderately eroded	1, 255	. 4
CdD2	Christiana fine sandy loam, 10 to 15 percent slopes, moderately eroded	546	. 2
CeA	Christiana silt loam, 0 to 2 percent slopes	224	. 1
CeB2	Christiana silt loam, 2 to 5 percent slopes, moderately eroded	2, 047	. 7
CeC2	Christiana silt loam, 5 to 10 percent slopes, moderately eroded	1, 458	. 5
CeD2	Christiana silt loam, 10 to 25 percent slopes, moderately eroded	459	. 1
CfB	Christiana-Urban land complex, 0 to 5 percent slopes	1, 316	. 4
CfC	Christiana-Urban land complex, 5 to 15 percent slopes	2, 318	. 7
CfE	Christiana-Urban land complex, 15 to 40 percent slopes	300	. 1
Cg	Clay pits	178	. 1
Ch	Codorus silt loam	1, 528	. 5
Ck	Codorus-Urban land complex	526	. 2
Cl	Colemantown loam	235	. 1
CmA	Collington fine sandy loam, 0 to 2 percent slopes	2, 935	. 9
CmB2	Collington fine sandy loam, 2 to 5 percent slopes, moderately eroded	10, 088	3. 2
CmC2	Collington fine sandy loam, 5 to 10 percent slopes, moderately eroded	4, 406	1. 4
CmC3	Collington fine sandy loam, 5 to 10 percent slopes, severely eroded	3, 245	1. 0
CmD2	Collington fine sandy loam, 10 to 15 percent slopes, moderately eroded	1, 965	0. 6
CmD3	Collington fine sandy loam, 10 to 15 percent slopes, severely eroded	2, 400	. 8
CmE2	Collington fine sandy loam, 15 to 40 percent slopes, moderately eroded	2, 656	. 9
CmE3	Collington fine sandy loam, 15 to 30 percent slopes, severely eroded	1, 621	. 5
CnB2	Collington loamy fine sand, 0 to 5 percent slopes, moderately eroded	511	. 2
CnC2	Collington loamy fine sand, 5 to 10 percent slopes, moderately eroded	283	. 1
CnD2	Collington loamy fine sand, 10 to 15 percent slopes, moderately eroded	157	(1)
CoA	Collington silt loam, 0 to 2 percent slopes	126	(1)
CoB2	Collington silt loam, 2 to 5 percent slopes, moderately eroded	316	. 1
CoC3	Collington silt loam, 5 to 10 percent slopes, severely eroded	178	. 1
CpB	Collington-Urban land complex, 0 to 5 percent slopes	893	. 3
CpC	Collington-Urban land complex, 5 to 15 percent slopes	809	. 3
Cr	Comus silt loam	230	. 1
CsB2	Croom gravelly loam, 3 to 8 percent slopes, moderately eroded	627	. 2
CsC2	Croom gravelly loam, 8 to 15 percent slopes, moderately eroded	646	. 2
CsC3	Croom gravelly loam, 8 to 15 percent slopes, severely eroded	828	. 3
CtB2	Croom gravelly sandy loam, 3 to 8 percent slopes, moderately eroded	916	. 3
CtC2	Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded	935	. 3
CtC3	Croom gravelly sandy loam, 8 to 15 percent slopes, severely eroded	1, 065	. 3
CtD2	Croom gravelly sandy loam, 15 to 25 percent slopes, moderately eroded	1, 655	. 5
CuB	Croom-Urban land complex, 0 to 8 percent slopes	396	. 1
CuC	Croom-Urban land complex, 8 to 15 percent slopes	615	. 2
CuE	Croom-Urban land complex, 15 to 35 percent slopes	975	. 3
DoA	Donlonton fine sandy loam, 0 to 2 percent slopes	239	. 1
DoB2	Donlonton fine sandy loam, 2 to 5 percent slopes, moderately eroded	370	. 1
Ek	Elkton silt loam	336	. 1
ElB	Elkton fine sandy loam, thick surface, 0 to 5 percent slopes	139	(1)
EmA	Elsinboro loam, 0 to 2 percent slopes	141	(1)
EmB2	Elsinboro loam, 2 to 5 percent slopes, moderately eroded	155	(1)
EnA	Elsinboro sandy loam, 0 to 2 percent slopes	414	. 1
EnB2	Elsinboro sandy loam, 2 to 5 percent slopes, moderately eroded	226	. 1
EnC2	Elsinboro sandy loam, 5 to 10 percent slopes, moderately eroded	174	. 1
EuB	Elsinboro-Urban land complex, 0 to 5 percent slopes	538	. 2
Fl	Fallsington loam	339	. 1
Fs	Fallsington sandy loam	1, 613	. 5

See footnote at end of table.

TABLE 3.—*Approximate acreage and proportionate extent of the soils*—Continued

Map symbol	Soil	Area	Extent	Map symbol	Soil	Area	Extent
		Acres	*Percent*			*Acres*	*Percent*
Fu	Fallsington-Urban land complex	151	(1)	Ky	Klej loamy sand	111	(1)
GaB	Galestown gravelly loamy sand, 0 to 8 percent slopes	2, 015	0. 7	LeA	Leonardtown silt loam, 0 to 2 percent slopes	4, 466	1. 4
GaC	Galestown gravelly loamy sand, 8 to 15 percent slopes	1, 060	. 3	LeB	Leonardtown silt loam, 2 to 5 percent slopes	1, 495	. 5
GdB	Galestown loamy sand, 0 to 8 percent slopes	1, 879	. 6	Ma	Made land	1, 104	. 4
GdC	Galestown loamy sand, 8 to 15 percent slopes	306	. 1	MfB2	Magnolia fine sandy loam, 2 to 5 percent slopes, moderately eroded	108	(1)
GeB	Galestown-Evesboro loamy sands, 0 to 8 percent slopes	2, 182	. 7	MgB2	Magnolia silt loam, 2 to 5 percent slopes, moderately eroded	170	. 1
GeC	Galestown-Evesboro loamy sands, 8 to 15 percent slopes	849	. 3	MgC2	Magnolia silt loam, 5 to 10 percent slopes, moderately eroded	71	(1)
GmB	Galestown-Urban land complex, 0 to 8 percent slopes	316	. 1	MhB2	Manor loam, 3 to 8 percent slopes, moderately eroded	62	(1)
GmC	Galestown-Urban land complex, 8 to 15 percent slopes	186	. 1	MhC2	Manor loam, 8 to 15 percent slopes, moderately eroded	116	(1)
GnC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	157	(1)	MhD2	Manor loam, 15 to 25 percent slopes, moderately eroded	216	. 1
GoB	Glenelg-Urban land complex, 0 to 8 percent slopes	220	. 1	MhF2	Manor loam, 25 to 60 percent slopes, moderately eroded	442	. 1
Gp	Gravel and borrow pits	2, 790	. 9	MkC	Manor-Urban land complex, 8 to 15 percent slopes	479	. 2
Ha	Hatboro silt loam	1, 239	. 4	MlA	Marr fine sandy loam, 0 to 2 percent slopes	209	. 1
HcC3	Howell clay loam, 6 to 12 percent slopes, severely eroded	367	. 1	MlB2	Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded	2, 108	. 7
HcD3	Howell clay loam, 12 to 20 percent slopes, severely eroded	245	. 1	MlB3	Marr fine sandy loam, 2 to 6 percent slopes, severely eroded	109	(1)
HoB2	Howell fine sandy loam, 2 to 6 percent slopes, moderately eroded	131	(1)	MlC2	Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded	422	. 1
HoC2	Howell fine sandy loam, 6 to 12 percent slopes, moderately eroded	145	(1)	MlC3	Marr fine sandy loam, 6 to 12 percent slopes, severely eroded	1, 659	. 5
HwB2	Howell silt loam, 0 to 6 percent slopes, moderately eroded	263	. 1	MlD3	Marr fine sandy loam, 12 to 20 percent slopes, severely eroded	892	. 3
HwC2	Howell silt loam, 6 to 12 percent slopes, moderately eroded	190	. 1	MlE	Marr fine sandy loam, 20 to 35 percent slopes	228	. 1
HwD2	Howell silt loam, 12 to 20 percent slopes, moderately eroded	200	. 1	MmA	Matapeake fine sandy loam, 0 to 2 percent slopes	414	. 1
HwE2	Howell silt loam, 20 to 35 percent slopes, moderately eroded	213	. 1	MmB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	299	. 1
Hy	Hyde silt loam	180	. 1	MnA	Matapeake silt loam, 0 to 2 percent slopes	775	. 3
Ik	Iuka fine sandy loam	424	. 1	MnB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	1, 548	. 5
ImA	Iuka sandy loam, local alluvium, 0 to 2 percent slopes	414	. 1	MnC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	909	. 3
ImB	Iuka sandy loam, local alluvium, 2 to 5 percent slopes	735	. 2	MnC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	465	. 2
In	Iuka silt loam	210	. 1	MnD2	Matapeake silt loam, 10 to 15 percent slopes, moderately eroded	518	. 2
IoA	Iuka silt loam, local alluvium, 0 to 2 percent slopes	818	. 3	MoB2	Matapeake silt loam, silty substratum, 2 to 5 percent slopes, moderately eroded	354	. 1
IoB	Iuka silt loam, local alluvium, 2 to 5 percent slopes	744	. 2	MpB	Matapeake-Urban land complex, 0 to 5 percent slopes	152	(1)
Iu	Iuka-Urban land complex	106	(1)	MpC	Matapeake-Urban land complex, 5 to 15 percent slopes	155	(1)
Ix	Iuka, local alluvium-Urban land complex	492	. 2	MrA	Matawan fine sandy loam, 0 to 2 percent slopes	194	. 1
Jo	Johnston silt loam	574	. 2	MrB2	Matawan fine sandy loam, 2 to 5 percent slopes, moderately eroded	198	. 1
Ju	Johnston-Urban land complex	120	(1)	MrC2	Matawan fine sandy loam, 5 to 10 percent slopes, moderately eroded	128	(1)
KeA	Keyport fine sandy loam, 0 to 2 percent slopes	340	. 1	MsA	Matawan loamy sand, 0 to 2 percent slopes	438	. 1
KeB2	Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded	731	. 2	MsB	Matawan loamy sand, 2 to 5 percent slopes	187	. 1
KeC2	Keyport fine sandy loam, 5 to 10 percent slopes, moderately eroded	340	. 1	MtA	Mattapex fine sandy loam, 0 to 2 percent slopes	476	. 2
KpA	Keyport silt loam, 0 to 2 percent slopes	1, 434	. 5	MtB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	660	. 2
KpB2	Keyport silt loam, 2 to 5 percent slopes, moderately eroded	2, 340	. 7				
KpC2	Keyport silt loam, 5 to 15 percent slopes, moderately eroded	286	. 1				
KrC3	Keyport silty clay loam, 5 to 10 percent slopes, severely eroded	118	(1)				
KuB	Keyport-Urban land complex, 0 to 10 percent slopes	419	. 1				

See footnote at end of table.

TABLE 3.—*Approximate acreage and proportionate extent of the soils*—Continued

Map symbol	Soil	Area	Extent	Map symbol	Soil	Area	Extent
		Acres	*Percent*			*Acres*	*Percent*
MuA	Mattapex silt loam, 0 to 2 percent slopes	644	0. 2	SgC3	Sassafras gravelly sandy loam, 5 to 10 percent slopes, severely eroded	1, 568	0. 5
MuB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	858	. 3	SgD2	Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded	2, 432	. 8
MvB	Mattapex-Urban land complex, 0 to 5 percent slopes	218	. 1	SgD3	Sassafras gravelly sandy loam, 10 to 15 percent slopes, severely eroded	3, 065	1. 0
Mw	Mixed alluvial land	3, 129	1. 0	SgE	Sassafras gravelly sandy loam, 15 to 30 percent slopes	5, 657	1. 8
MxC3	Monmouth clay loam, 5 to 10 percent slopes, severely eroded	470	. 2	ShA	Sassafras sandy loam, 0 to 2 percent slopes	1, 886	. 6
MxD3	Monmouth clay loam, 10 to 30 percent slopes, severely eroded	355	. 1	ShB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	5, 963	1. 9
MyA	Monmouth fine sandy loam, 0 to 2 percent slopes	321	. 1	ShC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	2, 217	. 7
MyB2	Monmouth fine sandy loam, 2 to 5 percent slopes, moderately eroded	1, 919	. 6	ShC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	1, 618	. 5
MyC2	Monmouth fine sandy loam, 5 to 10 percent slopes, moderately eroded	578	. 2	SkB	Sassafras-Urban land complex, 0 to 5 percent slopes	1, 329	. 4
MyD2	Monmouth fine sandy loam, 10 to 15 percent slopes, moderately eroded	94	(1)	SkC	Sassafras-Urban land complex, 5 to 15 percent slopes	1, 256	. 4
MzB2	Muirkirk loamy sand, 0 to 5 percent slopes, moderately eroded	338	. 1	SkE	Sassafras-Urban land complex, 15 to 30 percent slopes	276	. 1
MzC2	Muirkirk loamy sand, 5 to 10 percent slopes, moderately eroded	240	. 1	SlD	Sassafras-Collington-Aura gravelly sandy loams, 12 to 20 percent slopes	182	. 1
OcA	Ochlockonee sandy loam, local alluvium, 0 to 2 percent slopes	772	. 2	SlE	Sassafras-Collington-Aura gravelly sandy loams, 20 to 35 percent slopes	903	. 3
OcB	Ochlockonee sandy loam, local alluvium, 2 to 5 percent slopes	1, 477	. 5	SmA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	2, 060	. 7
OcC	Ochlockonee sandy loam, local alluvium, 5 to 10 percent slopes	360	. 1	SmB	Shrewsbury fine sandy loam, 2 to 5 percent slopes	641	. 2
OhA	Ochlockonee silt loam, local alluvium, 0 to 2 percent slopes	118	(1)	SnA	Shrewsbury silt loam, 0 to 2 percent slopes	487	. 2
OhB	Ochlockonee silt loam, local alluvium, 2 to 5 percent slopes	270	. 1	So	Shrewsbury-Urban land complex	163	. 1
Ok	Ochlockonee, local alluvium-Urban land complex	110	(1)	SpB	Silty and clayey land, gently sloping	931	. 3
Ol	Othello fine sandy loam	451	. 1	SpC	Silty and clayey land, sloping	1, 495	. 5
Ot	Othello silt loam	990	. 3	SpE	Silty and clayey land, steep	820	. 3
Pr	Plummer and Rutlege loamy sands	128	(1)	StB2	Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded	1, 821	. 6
RdA	Rumford loamy sand, 0 to 2 percent slopes	620	. 2	StC2	Sunnyside fine sandy loam, 5 to 10 percent slopes, moderately eroded	1, 930	. 6
RdB2	Rumford loamy sand, 2 to 5 percent slopes, moderately eroded	1, 775	. 6	StD2	Sunnyside fine sandy loam, 10 to 15 percent slopes, moderately eroded	807	. 3
RdC2	Rumford loamy sand, 5 to 10 percent slopes, moderately eroded	731	. 2	StE	Sunnyside fine sandy loam, 15 to 30 percent slopes	283	. 1
RdC3	Rumford loamy sand, 5 to 10 percent slopes, severely eroded	175	. 1	SuB2	Sunnyside loam, 0 to 5 percent slopes, moderately eroded	362	. 1
RdD2	Rumford loamy sand, 10 to 15 percent slopes, moderately eroded	207	. 1	SuC2	Sunnyside loam, 5 to 10 percent slopes, moderately eroded	307	. 1
ReB	Rumford-Evesboro loamy sands, 2 to 6 percent slopes	117	(1)	SuD2	Sunnyside loam, 10 to 15 percent slopes, moderately eroded	66	(1)
ReC	Rumford-Evesboro loamy sands, 6 to 12 percent slopes	567	. 2	SvC3	Sunnyside sandy clay loam, 5 to 10 percent slopes, severely eroded	595	. 2
ReD	Rumford-Evesboro loamy sands, 12 to 20 percent slopes	333	. 1	SvD3	Sunnyside sandy clay loam, 10 to 15 percent slopes, severely eroded	295	. 1
SaE	Sandy land, steep	12, 670	4. 1	SwB	Sunnyside-Urban land complex, 0 to 5 percent slopes	1, 054	. 3
ScB	Sandy and clayey land, gently sloping	825	. 3	SwC	Sunnyside-Urban land complex, 5 to 15 percent slopes	2, 232	. 7
ScC	Sandy and clayey land, sloping	1, 235	. 4	Sx	Swamp	1, 204	. 4
ScD	Sandy and clayey land, moderately steep	1, 016	. 3	Tm	Tidal marsh	2, 790	. 9
SfB2	Sassafras gravelly loam, 2 to 5 percent slopes, moderately eroded	321	. 1	WaA	Westphalia fine sandy loam, 0 to 2 percent slopes	142	(1)
SfC2	Sassafras gravelly loam, 5 to 10 percent slopes, moderately eroded	560	. 2	WaB2	Westphalia fine sandy loam, 2 to 6 percent slopes, moderately eroded	4, 309	1. 4
SfD2	Sassafras gravelly loam, 10 to 15 percent slopes, moderately eroded	565	. 2	WaB3	Westphalia fine sandy loam, 2 to 6 percent slopes, severely eroded	186	. 1
SgB2	Sassafras gravelly sandy loam, 2 to 5 percent slopes, moderately eroded	1, 380	. 4				
SgC2	Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded	1, 270	. 4				

See footnote at end of table.

TABLE 3.—*Approximate acreage and proportionate extent of the soils*—Continued

Map symbol	Soil	Area	Extent	Map symbol	Soil	Area	Extent
		Acres	*Percent*			*Acres*	*Percent*
WaC2	Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded	3, 820	1. 2	WeC2	Westphalia-Evesboro complex, 6 to 12 percent slopes, moderately eroded	940	0. 3
WaC3	Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded	4, 233	1. 4	WeC3	Westphalia-Evesboro complex, 6 to 12 percent slopes, severely eroded	2, 522	. 8
WaD2	Westphalia fine sandy loam, 12 to 20 percent slopes, moderately eroded	1, 861	. 6	WeD3	Westphalia-Evesboro complex, 12 to 20 percent slopes, severely eroded	4, 393	1. 4
WaD3	Westphalia fine sandy loam, 12 to 20 percent slopes, severely eroded	6, 196	2. 0	WoA	Woodstown sandy loam, 0 to 2 percent slopes	961	. 3
WbB2	Westphalia very fine sandy loam, 0 to 6 percent slopes, moderately eroded	658	. 2	WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	958	. 3
WbC2	Westphalia very fine sandy loam, 6 to 12 percent slopes, moderately eroded	601	. 2	WoC2	Woodstown sandy loam, 5 to 10 percent slopes, moderately eroded	100	(1)
WbD2	Westphalia very fine sandy loam, 12 to 20 percent slopes, moderately eroded	421	. 1	Wu	Woodstown-Urban land complex	413	. 1
WeB2	Westphalia-Evesboro complex, 2 to 6 percent slopes, moderately eroded	1, 156	. 4		Paved areas	989	. 3
					Unmapped area (U.S. Air Force Base)	4, 503	1. 4
					Total	310, 400	99. 6

[1] Less than 0.05 percent.

Adelphia Series

The Adelphia series consists of deep, moderately well drained soils that have a mottled lower subsoil through which water moves readily. These soils developed on old deposits of sandy materials that contain moderate amounts of silt and clay and a considerable amount of greensand. Greensand, technically called glauconite, is a dark-colored mineral that contains potash and iron. Adelphia soils occur on gently sloping to level uplands, mainly in the central part of the county.

Profile of Adelphia fine sandy loam (in a cultivated area about three-fourths of a mile southeast of Oak Grove Road, 330 feet northeast of State Route 202) :

Ap—0 to 10 inches, dark yellowish-brown (10YR 3/4) fine sandy loam; weak, very fine, granular structure; slightly hard, very friable, nonsticky and nonplastic; roots plentiful; medium acid to neutral (limed); abrupt, smooth boundary. 8 to 10 inches thick.

B1—10 to 14 inches, olive-brown (2.5Y 4/4) heavy fine sandy loam; weak, fine, subangular blocky structure; slightly hard, friable, nonplastic and nonsticky; roots common; very strongly acid; clear, wavy boundary. 3 to 6 inches thick.

B21t—14 to 23 inches, olive-brown (2.5Y 4/4) sandy clay loam; moderate, medium, subangular blocky structure; hard, friable to firm, slightly plastic and slightly sticky; few roots; distinct but discontinuous clay coatings; very strongly acid; clear, wavy boundary. 8 to 12 inches thick.

B22t—23 to 37 inches, olive (5Y 4/4) sandy clay loam; common, medium, distinct mottles of olive gray (5Y 5/2) and abundant, medium, prominent mottles of yellowish red (5YR 4/8); weak to moderate, fine, subangular blocky structure; hard, friable to firm, sticky and slightly plastic; very few roots; prominent but discontinuous olive-brown (2.5Y 4/4) coats and accumulations of clay; very strongly acid to extremely acid; clear, smooth boundary. 12 to 15 inches thick.

C1—37 to 44 inches, olive (5Y 4/3) fine sandy loam; common, coarse, prominent mottles of yellowish red (5YR 4/8); massive; friable, slightly sticky and slightly plastic; very strongly acid to extremely acid; gradual, wavy boundary. 6 to 12 inches thick.

C2—44 to 60 inches +, olive-gray (5Y 4/2) fine sandy loam; abundant, coarse, prominent mottles of yellowish red (5YR 4/8); massive (structureless); friable, nonsticky and nonplastic; extremely acid.

In Prince Georges County, the A horizon of Adelphia soils is fine sandy loam or silt loam. The content of clay in the B horizon ranges from 18 to 35 percent. The C horizon ranges from loamy sand to fine sandy loam. The solum ranges from about 30 to 45 inches in thickness.

In wooded areas, there are a dark-gray or dark olive-gray A1 horizon and a moderately thick, grayish-brown A2 horizon. The A1 horizon is as much as 4 inches thick. The B horizon generally ranges from olive to olive brown or light olive brown, but it grades toward yellowish brown in some places. Some gray mottles having low chroma occur in the B22t horizon and in the C horizon in some places. Prominent mottles ranging from strong brown to red occur most commonly in soils richer in glauconite. The depth to the B22t horizon ranges from about 16 to 25 inches and is generally greatest in profiles that are coarser textured in the A horizon.

The moderately well drained Adelphia soils occur on the same kinds of material as the well drained Collington and the poorly drained Shrewsbury soils. The Adelphia are somewhat similar to the Woodstown soils, but the Woodstown soils do not contain greensand.

The Adelphia soils are of moderate extent in this county. They occur in fairly small, widely distributed areas near the better drained and more extensive Collington soils. The Adelphia soils are important in farming, but special problems arise in other uses. The native vegetation is hardwoods, mostly oak, but there are some yellow-poplar, sweetgum, and maple trees. Pines also occur in some places.

Adelphia fine sandy loam, 0 to 2 percent slopes (AdA).—This soil is the one described for the Adelphia series. In some places the surface layer contains a considerable amount of coarse sand. Included in the mapping were spots that are somewhat sandier than normal.

This moderately well drained soil is suited to most crops if drainage is improved. Drainage can be improved by open ditches or by tile drains. The sandy surface

layer is easy to cultivate, and under good management, this soil is highly productive. (Capability unit IIw–5; drainage group 1; irrigation group 9; and woodland group 3)

Adelphia fine sandy loam, 2 to 5 percent slopes, moderately eroded (AdB2).—This soil has better surface drainage than Adelphia fine sandy loam, 0 to 2 percent slopes, but it is more susceptible to erosion. In some places the soil is somewhat thinner than normal, and in a few places shallow gullies have formed. Also included were areas where the surface layer contains some coarse sand and small spots where the plow layer is more olive and more sticky than normal.

On this moderately well drained soil, drainage may be needed for some crops, and if cultivation is regular, some measures are needed for protection against erosion. It is advisable to farm in graded rows or in graded strips of row crops alternated with close-growing crops. (Capability unit IIe–36; drainage group 1; irrigation group 9; and woodland group 3)

Adelphia fine sandy loam, 5 to 10 percent slopes, moderately eroded (AdC2).—This moderately well drained soil has good surface drainage. Included in mapping were some areas that have a surface layer that is coarser than fine sandy loam. Also included were some severely eroded areas and a few places where gullies have formed.

Control of erosion is the most important management problem, though drainage should be improved wherever feasible. Erosion is controlled and drainage improved by farming in graded strips and building diversion terraces on the long slopes. Cover crops can be used where a row crop is not followed by winter grain. (Capability unit IIIe–36; drainage group 1; irrigation group 9; and woodland group 9)

Adelphia silt loam, 0 to 2 percent slopes (AhA).—This nearly level soil has a finer textured surface layer than the soil described for the Adelphia series. When the surface layer is dry, it feels soft and floury in most places. In some places, however, the surface layer contains fine gritty material.

This moderately well drained soil is suited to most crops, but its use is limited by impeded drainage. Because this soil is difficult to work when it is wet, planting dates are usually delayed. Open ditches are needed to improve drainage. Tile may be used to intercept seepage and to drain wet spots. (Capability unit IIw–1; drainage group 1; irrigation group 13; and woodland group 3)

Adelphia silt loam, 2 to 5 percent slopes, moderately eroded (AhB2).—In most places the silty surface layer or plow layer of this soil feels soft and floury when it is dry, but in some places it feels slightly gritty. Included in mapping are a few places that are not eroded.

Control of erosion is the most important management problem, but drainage probably is needed for some uses. The soil holds a good supply of moisture for the use of plants. Its subsoil is moderately slow in permeability. Seepage or wet spots can be drained with tile. Excess runoff can be controlled by farming in graded strips. Natural waterways should be kept in sod. Excess moisture generally delays cultivation in spring. (Capability unit IIe–16; drainage group 1; irrigation group 13; and woodland group 3)

Aura Series

The Aura series consists of well-drained gravelly soils that have a red subsoil and are deep to very gravelly, very firm materials. These soils have developed on old deposits of sandy and clayey gravel. The Aura soils are sloping to moderately steep. They occur mostly in bluff-like areas that are roughly parallel to the Potomac River.

Profile of Aura gravelly loam (in a wooded area about 2 miles east of Fort Washington):

A1—0 to 1 inch, dark-gray (10YR 4/1) gravelly loam; weak, very fine, granular structure; very friable, slightly sticky but nonplastic; roots abundant; extremely acid; clear, wavy boundary. 1 to 3 inches thick.

A2—1 to 9 inches, brown (10YR 5/3) gravelly loam; weak, fine, granular structure; very friable, slightly sticky but nonplastic; roots abundant; very strongly acid; gradual, wavy boundary. 6 to 10 inches thick.

B1—9 to 13 inches, strong-brown (7.5YR 5/6) gravelly heavy loam; weak, fine and medium, subangular blocky structure; friable, slightly sticky and slightly plastic; roots plentiful; very strongly acid; clear, smooth boundary. 3 to 4 inches thick.

B21t—13 to 19 inches, yellowish-red (5YR 5/6) gravelly clay loam; moderate, fine and medium, subangular blocky structure; friable to firm, slightly sticky and slightly plastic; roots common; discontinuous clay coatings; very strongly acid; gradual, wavy boundary. 5 to 9 inches thick.

B22t—19 to 30 inches, red (2.5YR 4/8) gravelly sandy clay loam; moderate, fine and medium, subangular blocky structure; very firm, sticky and plastic; few roots; prominent, continuous clay coatings; very strongly acid; abrupt, wavy boundary. 10 to 16 inches thick.

B23t—30 to 45 inches, red (2.5YR 4/8) very gravelly sandy clay loam; massive; very hard, very firm and compact; few prominent accumulations of clay, mainly on pebbles; very strongly acid; gradual, wavy boundary. 12 to 24 inches thick.

C—45 to 96 inches +, red (2.5Y 4/8) very gravelly sandy loam; massive; hard, friable to firm; no roots; very strongly acid.

The A horizon of Aura soils is gravelly loam. The Bt horizon is gravelly sandy loam, gravelly sandy clay loam, or gravelly clay loam. The average content of clay in the B horizon is between 18 and 35 percent. The C horizon contains sand and gravel. In most places the content of gravel increases with depth. The solum ranges from about 3 feet to 6 feet or more in thickness.

In cultivated areas the Ap horizon is dark grayish brown. The A2 horizon is brown, yellowish brown, or light olive brown. The B horizon ranges from strong brown or yellowish red to red, but redness commonly increases with depth. Mottles as a result of poor aeration do not occur, but there are variegations of red, yellow, or brown in different shades. The depth to the massive, very firm, very hard B23t horizon ranges from about 20 inches to more than 30 inches. The B21t and B22t horizons vary considerably in firmness.

The Aura soils are similar to Croom soils and are on the same general kinds of material, but Aura soils are dominantly red instead of yellowish brown. They are near the gravelly Sassafras soils but are redder in the lower horizons.

The Aura soils are fairly extensive, particularly in the southwestern part of the county. They have a fairly thin root zone and are somewhat droughty during extended dry periods. The Aura soils are in areas where residential development is rapid. In most places these soils provide an excellent source of gravel for road and other construction. The native vegetation is chiefly oak, but other hardwoods are common. Virginia pine grows in many areas.

Aura gravelly loam, 2 to 6 percent slopes, moderately eroded (AuB2).—In the less eroded areas, this soil is like

the one described for the Aura series. In a few areas the surface layer is somewhat sandier than that of the soil described. Included in the mapping were a few areas that are nearly level and some small areas where the subsoil is lighter red than the subsoil of a typical Aura soil.

The use of this soil is limited by a fairly thin root zone. Because this soil is moderately deep to shallow over very firm soil material, it is somewhat droughty in long dry periods. The hazard of erosion limits the use of this soil. (Capability unit IIs–7; irrigation group 11; woodland group 12; drainage group not assigned)

Aura gravelly loam, 6 to 12 percent slopes, moderately eroded (AuC2).—Except for steeper slopes, this soil is like Aura gravelly loam, 2 to 6 percent slopes, moderately eroded. Some areas are only slightly eroded, and in a few places shallow gullies have formed.

The control of erosion is generally the most important problem of management, but seasonal droughtiness and a restricted root zone also influence management, use, and yields. Contour tillage or using graded strips are conservation practices that help to control erosion. Waterways should be kept in sod. (Capability unit IIIe–7; irrigation group 11; woodland group 16; drainage group not assigned)

Aura gravelly loam, 6 to 12 percent slopes, severely eroded (AuC3).—Except that it is shallower to the underlying very firm subsoil, this soil is like Aura gravelly loam, 2 to 6 percent slopes, moderately eroded. The red gravelly and clayey subsoil material is exposed in most places. In a few places the surface layer contains some sandy material, and in some places shallow gullies have formed.

Cultivation is limited by the hazard of erosion. Erosion can be controlled by using rotations, contour strips with diversion terraces, and sod waterways. This soil has severe limitations if used for lawns and landscaping because erosion has reduced the available moisture-holding capacity to a critical stage. (Capability unit IVe–7; irrigation group 11; woodland group 17; drainage group not assigned)

Aura gravelly loam, 12 to 20 percent slopes (AuD).—This soil occurs on moderately steep hillsides, mainly in the southwestern part of the county. The original surface layer has been mixed with some of the sticky, reddish, subsoil material. Included with this soil in mapping were some severely eroded areas and areas where shallow gullies have formed. Also included were a few areas where the surface layer is gravelly sandy loam.

On this moderately steep soil, the hazard of erosion is severe, and cultivation is severely limited. Crop rotations, contour strips with diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IVe–7; irrigation group 11; woodland group 16; drainage group not assigned)

Aura and Croom gravelly loams, 20 to 50 percent slopes (AvE).—This mapping unit consists of the steepest areas of the Aura and the Croom soils that occur in the county. The Aura soils are redder than the Croom soils, but in other characteristics the two soils are similar. Areas mapped as these soils may contain either Aura gravelly loam or Croom gravelly loam, but generally these areas do not contain both. Included in mapping were some areas that are sandier than normal and a few areas where gullies have formed. Also included were a few areas that contain glauconite, or greensand.

These steep and very steep soils are not suitable for cultivation. Many areas are severely eroded (fig. 5). The most intensive use suitable for this soil is woodland or limited grazing. (Capability unit VIIe–2; and woodland group 16; irrigation group and drainage group not assigned)

Figure 5.—**This old roadway through an area of the Aura and Croom gravelly loams, 20 to 50 percent slopes, has been abandoned because erosion has been severe.**

Beltsville Series

The Beltsville series consists of moderately well drained soils that have only moderate effective depth to a thick, very compact fragipan in the lower subsoil. This pan is densely packed, but it is not cemented. Locally, it is called hardpan, or foolish earth. The Beltsville soils developed in silty to sandy materials that probably were deposited by wind over old alluvium. This alluvium is generally sandy, but it is gravelly in places. These soils occur mainly on level to gently sloping uplands, though some areas are fairly steep.

Profile of Beltsville silt loam (in a wooded area on Floral Park Road, near the village of T.B.):

A1—0 to 2 inches, grayish-brown (2.5Y 5/2) silt loam; weak, fine, granular structure; loose, nonplastic and nonsticky; roots abundant; very strongly acid; abrupt, smooth boundary. 1 to 2 inches thick.

A2—2 to 9 inches, light olive-brown (2.5Y 5/4) silt loam; weak, fine, granular and very weak, fine, subangular blocky structure; slightly hard, friable, slightly plastic and nonsticky; roots plentiful; old root channels filled with dark grayish-brown (2.5Y 4/2) silt; very strongly acid to extremely acid; clear, smooth boundary. 6 to 9 inches thick.

B1—9 to 14 inches, yellowish-brown (10YR 5/6) heavy silt loam; weak, fine, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; roots common; root channels lined with grayish silt; very strongly acid to extremely acid. 5 to 8 inches thick.

B2t—14 to 25 inches, yellowish-brown (10YR 5/6) light silty clay loam variegated with light yellowish brown (10YR 6/4); moderate, thin to medium, platy structure; hard, firm, and sticky and slightly plastic; few roots; distinct but discontinuous strong-brown (7.5YR 5/6) coats and accumulations of clay; very strongly acid to extremely acid; clear, smooth boundary. 10 to 14 inches thick.

Bx—25 to 50 inches, light olive-brown (2.5YR 5/6) light silty clay loam; common, medium, distinct mottles of yellowish red (5YR 4/8) and strong brown (7.5YR 5/8); compound structure: strong, coarse to very coarse, prismatic and strong, thin, platy; very dense and compact; very hard, very firm and brittle, sticky and plastic; few fine roots between prisms; distinct strong-brown (7.5YR 5/8) clay coats on upper surface of plates; thick, prominent, pale-brown (10YR 6/3) clay coats on vertical faces of prisms; very strongly acid to extremely acid; abrupt, wavy boundary. 20 to 30 inches thick.

IIC—50 to 72 inches, very pale brown (10YR 7/3) gravelly sandy loam irregularly streaked with light gray (2.5Y 7/2); massive; upper part very hard when dry, moist, or wet, but with increasing depth, horizon gradually becomes friable when moist and nonsticky and nonplastic when wet; upper surface of peds coated with variegated brown silt or clay; extremely acid.

In Prince Georges County, the A horizon of Beltsville soils is silt loam or fine sandy loam. The content of clay in the B horizon ranges from 18 to 35 percent. The C horizon is coarser textured than the solum, but in most places it is sandy and gravelly. The solum ranges from about 40 inches to more than 50 inches in thickness.

In most cultivated areas the plow layer is brown or grayish brown. Plowing commonly destroys the A1 and A2 horizons. In most places the B horizon has a hue of 10YR, but the Bx horizon has a hue of 2.5YR in some places. The value in the B horizon ranges from 4 to 6, and chroma ranges from 6 to 8. Some faint mottling having a low chroma occurs in the lower part of the B2t horizon in places where this horizon is thick, but the upper 10 inches is not mottled. Mottling in the Bx horizon has a reddish hue and a high chroma in most places, but a low chroma in some places. The IIC horizon is pale in color and is variegated, streaked, or mottled in some places.

The fragipan in the Beltsville soils is very slowly permeable. Consequently, these soils have a water table that is temporarily perched above the fragipan in wet seasons. The fragipan and the IIC horizon below the temporary water table frequently are very dry or only slightly moist.

The Beltsville are moderately well drained soils on the same kinds of material as the well drained Chillum soils and the poorly drained Leonardtown soils. This material is similar but shallower and less silty than that underlying the moderately well drained Butlertown soils. On deposits of silt underlain by looser, sandier deposits than those underlying the Beltsville soils, there are the well drained Matapeake soils, the moderately well drained Mattapex soils, and the poorly drained Othello soils.

The Beltsville soils are important in farming, but they are difficult to manage. Special problems occur on these soils in residential areas, particularly in areas without sewerage systems. The native vegetation is mainly hardwoods, but in some places it is Virginia pine.

Beltsville fine sandy loam, 0 to 2 percent slopes (BeA).—This soil is typical of Beltsville soils in areas that have a fine sandy loam surface layer. In some places this layer contains a considerable amount of medium and fairly coarse sand. Included in the mapping are some spots that are wetter than normal. Also included were a few areas that have a somewhat more reddish subsoil, and a few areas in which the subsoil is clay and does not have a fragipan. This clay subsoil does not affect the use or management of the soil.

Because this moderately well drained soil is nearly level, runoff is slow and the soil stays wet for a considerable period after rains unless artificial drainage is provided. Drainage is the most important management practice on this soil; this soil is fairly easy to work when it is not wet. In most places erosion is not an important problem. (Capability unit IIw–9; drainage group 6–1B; irrigation group 8; and woodland group 12)

Beltsville fine sandy loam, 2 to 5 percent slopes, moderately eroded (BeB2).—This soil has better surface drainage than Beltsville fine sandy loam, 0 to 2 percent slopes, but it is more susceptible to erosion. The surface layer is dominantly of fine sand, but in places this layer contains a considerable amount of medium and coarse sand. In some places this soil is thin or shallow to the underlying fragipan. Included in the mapping were a few areas that are wetter than normal. Also included were places where the upper part of the subsoil is somewhat reddish.

Erosion is the most important problem in managing this soil. Surface drainage can be improved and erosion checked by planting crops in graded strips and using diversion terraces. The drainageways should be kept in sod. (Capability unit IIe–36; drainage group 6–1B; irrigation group 8; and woodland group 12)

Beltsville fine sandy loam, 5 to 10 percent slopes, moderately eroded (BeC2).—Except for steeper slopes, this soil is like Beltsville fine sandy loam, 2 to 5 percent slopes, moderately eroded. Fine sand is dominant in the surface layer, but in places this layer contains coarse sand. In some areas, mainly where shallow gullies have formed, this soil is somewhat shallower than normal to the underlying fragipan, and the plow layer is a mixture of the original surface soil and the sticky subsoil material. Included in the mapping were a few areas that are wetter than normal and a few spots where the upper part of the subsoil is somewhat reddish.

This soil is suited to most general crops, but its use is limited by a shallow root zone and slow internal drainage. Runoff is rapid, and the control of erosion is the most important problem of management. On long slopes, graded strips and diversion terraces can be used to control erosion and to improve drainage. (Capability unit IIIe–36; drainage group 6–1B; irrigation group 8; and woodland group 16).

Beltsville silt loam, 0 to 2 percent slopes (BlA).—This soil is typical of Beltsville soils in areas that have a silt loam surface layer. The surface layer feels soft and floury and contains little, if any, gritty material. In a few small areas, the original surface soil has been mixed with some of the sticky subsoil material, but nowhere has the underlying fragipan been exposed by erosion. Included in the mapping were a few areas that have some fine sandy materials in the surface layer and a few spots that are gravelly. Also included were some small areas that have a somewhat reddish subsoil.

Artificial drainage is needed for most uses, for drainage is the most important problem. Ditches are best for removing excess water. This soil must be worked when it is neither too wet nor too dry, for the range of moisture content is narrow. (Capability unit IIw–8; drainage group 6–1A; irrigation group 11; and woodland group 12)

Beltsville silt loam, 2 to 5 percent slopes, moderately eroded (BlB2).—This is one of the most extensive soils in the county. It is well distributed on all the smooth uplands of the county except those in the central part, where the soils that developed from greensand are dominant. Because this soil is sloping, erosion is a greater problem of management than drainage. The surface

layer is a mixture of the original silty surface soil and some of the finer subsoil material. In some areas this soil is uneroded or only slightly eroded, and in a few areas it is severely eroded. In these severely eroded areas, the fragipan is near the surface. Gullies, some of them deep, have formed in places. Included in the mapping were areas where the surface layer contains a considerable amount of sandy material. Also included were some spots that are gravelly and a few places where the subsoil is redder than normal.

Runoff is rapid because this soil has a dense subsoil, imperfect drainage, and gentle slopes. Contour strips, supported by diversion terraces and sod waterways, help to control runoff and erosion. This soil is suited to corn, soybeans, hay crops except alfalfa, and pasture. (Capability unit IIe–13; drainage group 6–1A; irrigation group 11; and woodland group 12)

Beltsville silt loam, 5 to 10 percent slopes, moderately eroded (BlC2).—Except for steeper slopes, this soil is like Beltsville silt loam, 2 to 5 percent slopes, moderately eroded. Protecting the soil from erosion is a greater problem of management than drainage. The surface layer is a mixture of the original silty surface soil and some of the sticky subsoil material. In some places this soil is uneroded or only slightly eroded. A few shallow gullies have formed in some areas. Included in the mapping were a few spots that are wetter than normal and a few areas that have a reddish subsoil. Also included were small areas that have fine sand or gravel in the surface layer.

This soil is suited to most general crops, but its use is limited by a thin root zone and slow internal drainage. If row crops are grown on this soil, contour strips and diversion terraces are needed to prevent rapid runoff and excessive erosion. (Capability unit IIIe–13; drainage group 6–1A; irrigation group 11; and woodland group 16)

Beltsville silt loam, 5 to 10 percent slopes, severely eroded (BlC3).—This soil is so severely eroded that continued farming is marginal at best. The yellowish-brown surface layer is thin and consists of mixed silt and clay that is very hard when dry and sticky when wet. This soil is very shallow to the underlying fragipan, and in some places yellow and brown flakes of fragipan material are mixed with the surface layer. In many areas gullies, some of them deep, have formed. Included in the mapping were a few areas in which the surface layer contains more sand or is redder than normal. Also included were small acreages in which the profile contains greensand, or glauconite, and does not have a dense hard subsoil.

This soil is best suited to hay crops, except alfalfa, and to pasture. Corn and other tilled crops should be planted no more than 1 year in 5, and hay, small grain, pasture, or other close-growing crops should be grown the rest of the time. Practices that control runoff and erosion are needed. (Capability unit IVe–9; drainage group 6–1A; irrigation group 11; and woodland group 17)

Beltsville silt loam, 10 to 15 percent slopes, severely eroded (BlD3).—This soil is thin or shallow to the underlying dense fragipan. The surface layer is a mixture of the original surface layer and the finer textured subsoil material. In many places shallow and deep gullies have formed. In some areas this soil is uneroded or only slightly eroded. Included in mapping were a few areas that have a sandy or gravelly surface layer. Also included were a few spots that are wetter than normal and a few areas that have a reddish subsoil.

Because of the steep slopes and severe erosion, this soil is suitable for cultivation only at long intervals. If a good sod is maintained, however, this soil produces good pasture or forage. (Capability unit VIe–2; drainage group 6–1A; and woodland group 17; irrigation group not assigned)

Beltsville-Urban land complex, 0 to 5 percent slopes (BmB).—This complex consists of Beltsville soils and disturbed land that is mainly of Beltsville soil material. These areas are used for community development. They have been rearranged into complex patterns on the landscape. Although the single soils can be recognized, mapping them separately is impractical. About 25 percent of each area mapped as this complex consists of Beltsville soils similar to the soil described as typical of the series. The remainder of the acreage consists of Beltsville soils that have been severely disturbed or altered by man.

On about 60 percent of each area, the Beltsville soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. The surface layer of these severely disturbed areas has variable texture and may be fine sandy loam, silt loam, or a mixture of sand, silt, and clay in any proportion.

About 15 percent of this unit consists of land fills, 18 inches or more in depth, or places where most of the Beltsville soil profile has been cut away. The surface layer here is either a mixture of sand, silt, and clay in various proportions, or it is a dense hardpan of silty and clayey materials. (Drainage group 6–1A; capability unit, irrigation group, and woodland group not assigned)

Beltsville-Urban land complex, 5 to 15 percent slopes (BmC).—This mapping unit is like Beltsville-Urban land complex, 0 to 5 percent slopes, but it is on steeper slopes and more of it is Made land.

About 15 percent of each area mapped as this complex consists of Beltsville soils like the soils described as typical of the Beltsville series; the rest is Beltsville soils that have been severely disturbed or altered by man.

About 50 percent of the acreage of this complex consists of severely disturbed Beltsville soils that are covered with as much as 18 inches of soil material, or that have had as much as two-thirds of the original soil profile removed. The surface layer in these severely disturbed areas has variable texture and may be fine sandy loam, silt loam, or a mixture of sand, silt, and clay in any proportion.

About 35 percent of the acreage of this unit consists of land fills, 18 inches or more in depth, or places where most of the Beltsville soil profile has been cut away. The surface layer here is either a mixture of sand, silt, and clay in various proportions, or it is a dense hardpan of silty and clayey materials. (Drainage group 6–1A; capability unit, irrigation group, and woodland group not assigned)

Bibb Series

The Bibb series consists of deep, level or nearly level, poorly drained soils on flood plains along streams of the Coastal Plain. These soils are made up of materials that were washed from silty and sandy uplands and recently deposited along many of the major streams and drainageways in the county.

Profile of Bibb silt loam (on the wooded flood plain of Mattawoman Creek, about 1 mile south of Bealle):

A11—0 to 4 inches, dark grayish-brown (2.5Y 4/2) silt loam; weak, fine, granular structure; soft, very friable, nonsticky and nonplastic; roots abundant; very strongly acid; clear, smooth boundary. 3 to 4 inches thick.

A12—4 to 10 inches, dark grayish-brown (2.5Y 4/2) silt loam; few, medium, distinct mottles of dark brown (7.5YR 4/2); very weak, medium, subangular blocky and weak, fine, granular structure; soft, friable, slightly sticky but nonplastic; many roots; very strongly acid; clear, smooth boundary. 5 to 8 inches thick.

B21g—10 to 26 inches, dark-gray (5Y 4/1) silt loam; few, medium, distinct mottles of dark brown (7.5YR 4/2); very weak, coarse, blocky structure; slightly hard, friable, slightly sticky but nonplastic; few roots; very strongly acid; clear, smooth boundary. 12 to 18 inches thick.

B22g—26 to 36 inches, gray or light-gray (5Y 6/1) loam; common, medium, distinct mottles of dark yellowish brown (10YR 4/4); very weak, very coarse, blocky structure; slightly hard, friable, nonsticky and nonplastic; very few roots; very strongly acid and extremely acid; abrupt, smooth boundary. 8 to 12 inches thick.

IICg—36 to 54 inches +, gray or light-gray (5Y 6/1) silty clay; common, medium, distinct mottles of brown or dark brown (7.5YR 4/4); massive (structureless); hard, firm, sticky and plastic; some coarse sand and fine waterworn gravel; extremely acid.

In Prince Georges County the A and the B horizons of Bibb soils are silt in most places, but in many areas they are sandy loam. In some places where the A horizon is sandy loam the B horizon is somewhat finer, generally silt loam. The C horizon may be almost any texture and commonly is unconforming. The solum ranges from about 30 to more than 40 inches in thickness.

In cultivated areas the plow layer of Bibb soils is usually grayish brown or light olive brown (2.5Y 5/2 or 2.5Y 5/4). In places the B horizon is thicker than described, for the C horizon occurs at a depth of more than 4 feet. In the B horizon the matrix has a hue of 2.5Y or 5Y in most places. The chroma of this matrix is 2 or less and value is 4 to 6. In some areas where Bibb soils have been influenced by glauconite, their hue is greenish. Mottling has a hue of 10YR or 7.5YR in most places, but it is near 5YR in areas influenced by glauconite. The mottling has a value of 4 to 6 and a chroma of 4 to 8. The C horizon varies in color and is gleyed.

In wet periods the water table in Bibb soils is at or near the surface, but in long dry periods it is usually in the IIC horizon. These soils are subject to flooding.

The Bibb soils are on the same general kinds of material as the well drained Ochlockonee soils, the moderately well drained Iuka soils, and the very poorly drained Johnston soils. They are, in many respects, similar to the Hatboro soils, the material of which washed from areas of weathered acid crystalline rock and commonly contains much fine mica. Locally, the Bibb soils contain fine greensand.

The Bibb soils are extensive in Prince Georges County. They are used little for farming, but some areas produce corn, hay, and pasture. Most areas are subject to flooding. Residential use is limited by flooding and poor drainage. Some areas have been made into parks and playgrounds, and other areas are suitable for these uses. Most areas of this soil are in forest consisting of maple, gum, oak, and other hardwoods that tolerate wetness.

Bibb sandy loam (Bn).—This soil has a sandy loam surface layer about 3 feet thick but in other respects is similar to the soil described for the series. It is nearly level in most places but is gently sloping in a few.

This poorly drained soil on flood plains is wet for long periods. Because the soil is sandy, it is fairly easy to drain and to work and manage after it is drained. It can be drained best by tile if outlets are adequate. In frequently flooded areas, use is limited to grazing, woodland, wildlife habitat, and recreation. (Capability unit IIIw–6; drainage group 11–B, irrigation group 10A; and woodland group 2)

Bibb silt loam (Bo).—Except for the silt loam surface layer about 3 feet thick, this soil is like the one described for the Bibb series. It is one of the most extensive mapping units in Prince Georges County. It feels floury when dry and is somewhat sticky when wet. In a few areas the surface layer contains medium-sized sand and feels gritty. Most areas of this soil are nearly level, though a few small areas are gently sloping.

This poorly drained soil is wet for long periods. It is somewhat more difficult to drain and to work than the Bibb sandy loam. Either ditches or tile can be used for drainage if outlets are adequate. These soils are not susceptible to erosion. They can be planted to row crops continuously for several years if cover crops are used after the row crops are harvested and the land is allowed to remain fallow every few years. In areas where this soil is subject to frequent flooding, use is limited mostly to grazing, woodland, wildlife, or recreation. (Capability unit IIIw–7; drainage group 11–A; irrigation group 10; and woodland group 2)

Bibb-Urban land complex (Br).—About 25 percent of this complex is Bibb soils that have a sandy loam or silt loam surface layer; about 55 percent has been covered with various kinds of soil material to a depth of 6 to 18 inches; and the remaining 20 percent consists of Bibb soils that have been covered with 18 inches or more of soil material of varied texture. Most areas are nearly level, but in a few places they are slightly more sloping.

This mapping unit has been filled so that it can be used for streets, buildings, parking lots, playgrounds, and home gardens, but in most areas the fills have only slightly reduced the hazard of flooding. (Drainage group 11–A; capability unit, irrigation group, and woodland group not assigned)

Butlertown Series

The Butlertown series consists of deep, moderately well drained soils that are a little better drained than most moderately well drained soils but that are seasonally a little too wet to be well drained.

The Butlertown soils occur on the uplands of the Coastal Plain, where they developed in a thick mantle of acid silt and very fine sand that probably was deposited by wind. These soils are nearly level and gently sloping.

Profile of Butlertown silt loam (in a nearly level cultivated field near Queen Anne Road, just south of Central Avenue and west of Hardesty):

Ap—0 to 9 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; soft, friable, slightly sticky but nonplastic; roots plentiful; many fine pores; strongly acid; abrupt, smooth boundary. 9 to 10 inches thick.

B21t—9 to 18 inches, yellowish-brown (10YR 5/6) heavy silt loam; weak, medium, blocky structure; slightly hard, friable, slightly sticky and slightly plastic; roots common; weak, discontinuous clay films; strongly acid; clear, smooth boundary. 8 to 10 inches thick.

B22t—18 to 32 inches, strong-brown (7.5YR 5/6) light silty clay loam; moderate, medium, blocky structure; hard, friable to firm, sticky and plastic; few roots but many root channels and pores; distinct, thin but continuous clay coatings; very strongly acid; clear, smooth boundary. 12 to 18 inches thick.

Bx—32 to 45 inches, strong-brown (7.5YR 5/6) light silty clay loam; common, fine, distinct mottles of light grayish brown (10YR 6/2); compound structure: moderate, thin and medium, platy and very weak, fine, prismatic; hard, moderately firm and somewhat brittle, plastic and slightly sticky; very few roots; nearly continuous strong-brown (7.5YR 5/6) and yellowish-red (5YR 4/8) clay coats are prominent around prisms but thinner between plates; very strongly acid and extremely acid; gradual, smooth boundary. 10 to 15 inches thick.

C—45 to 72 inches +, dark yellowish-brown (10YR 4/4) silt loam faintly variegated with brown (10YR 5/3 and 7.5YR 4/4); weakly stratified; slightly hard, friable, slightly sticky and slightly plastic; very strongly acid and extremely acid.

The A horizon is silt loam, and the B horizon ranges from silt loam to silty clay loam. The C horizon is silt or silt loam but contains some very fine sand. The solum ranges from about 42 to 56 inches in thickness.

In wooded areas there is a thin, very dark A1 horizon and a light yellowish-brown A2 horizon. In most places the Bt horizon has a hue of 10YR or 7.5YR, normally a value of 5, and a chroma of 6 to 8. The matrix of the Bx horizon is of the same color as the Bt horizon, but the Bx horizon has variegations and mottles with a chroma of 2 or lower. The C horizon is somewhat variegated and may have mottling of low chroma.

Depth to the Bx horizon (fragipan) is about 30 to 38 inches in most places. This horizon varies in firmness and brittleness, but generally it is not strongly expressed.

The Butlertown soils are not so well drained as the Matapeake soils but are on the same kinds of material. They are a little better drained than the Mattapex soils, which are thinner than the Butlertown soils and are underlain by sandy and gravelly materials. Butlertown soils are better drained and more readily penetrated by water than the Beltsville soils, which have a dense hardpan in the lower part of the subsoil.

The Butlertown soils are of limited extent in Prince Georges County. They are in widely scattered areas but occur mainly in the vicinity of Hardesty, of Bowie, and of Tippett. These soils are suited to many uses, but impeded drainage somewhat limits their use. The native vegetation is chiefly oak, hickory, and yellow-poplar, but Virginia and loblolly pine grow in places.

Butlertown silt loam, 0 to 5 percent slopes, moderately eroded (BtB2).—This soil has adequate surface drainage in most places, though internal drainage is moderately slow. In the more nearly level areas, this soil tends to be wet at times. The silty surface layer feels soft and floury when dry and is somewhat sticky when wet. Included in mapping were a few areas where the surface layer contains fine sand.

Control of erosion is the most important problem in managing this soil, but in the more level areas, drainage is needed for some uses. The soil holds a good supply of moisture available for plants. Seepage areas or wet spots can be drained with tile. Runoff can be controlled by farming in graded strips, and natural waterways should be kept in sod. Because this soil contains excess moisture, cultivation is generally delayed in spring. (Capability unit IIe–16; drainage group 2–A; irrigation group 13; and woodland group 11)

Chillum Series

The Chillum series consists of moderately deep, well-drained soils on uplands of the Coastal Plain. These soils developed in a mantle of thin, wind-deposited silty to somewhat sandy materials that are underlain by older deposits of very hard sandy and gravelly material. Most areas of the Chillum soils are gently sloping to moderately sloping, but some areas are nearly level and some are steep.

Profile of Chillum silt loam (in a wooded area one-half mile south of Cheltenham, on U.S. Highway No. 301):

A1—0 to 1 inch, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; slightly sticky and very slightly plastic; roots abundant; strongly acid; clear, smooth boundary. 1 to 2 inches thick.

A2—1 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure but tends to be thin, platy; friable; very slightly sticky but nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 6 to 8 inches thick.

B21t—8 to 16 inches, brown or dark-brown (7.5YR 4/4) heavy silt loam; very weak, fine and medium, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; roots fairly common; few, faint clay coatings; common fine pores; very strongly acid; gradual, smooth boundary. 6 to 10 inches thick.

B22t—16 to 28 inches, strong-brown (7.5YR 5/6) light silty clay loam; moderate, fine to coarse, subangular blocky structure; hard, friable to firm, sticky and plastic; few roots; distinct to prominent accumulations and continuous coats of clay; very strongly acid; abrupt, smooth boundary. 10 to 20 inches thick.

IIC1—28 to 32 inches, pale-brown (10YR 6/3) fine gravelly sandy loam variegated with brown and yellowish red (10YR 5/3 and 5YR 4/6); massive; very firm and brittle when moist or wet; fine, smooth gravel, about 20 percent by volume; very strongly acid; clear, smooth boundary. 4 to 8 inches thick.

IIC2—32 to 96 inches +, pale-brown (10YR 6/3) very gravelly sandy loam variegated with brown (10YR 5/3), dark yellowish brown (10YR 4/4), and yellowish red (5YR 4/6); massive; extremely hard, very firm, and very brittle; 50 to 80 percent of horizon, by volume, is fine and medium smooth gravel, percentage increasing with depth; gravel is very strongly weathered and contains many soft fragments; some seams of ferruginous sandstone, or ironstone; very strongly acid.

In Prince Georges County, the A horizon of Chillum soils is silt loam. The B horizon is heavy silt loam or light silty clay loam and has a content of clay of 18 to 35 percent. The C horizon is coarser textured than the solum, is nonconforming, and in many places is gravelly. In uneroded areas the solum ranges from 24 to 36 inches in thickness.

In cultivated areas the A horizon, or plow layer, is brown to grayish brown. The B horizon generally is strong brown but ranges to yellowish brown, and in places, to reddish brown or reddish yellow. The B horizon ranges from 4 to 6 in value and from 4 to 8 in chroma. In places some faint mottling or variegation occurs in the lower part of the B22t horizon, but nowhere is the chroma 2 or less. The C horizon is commonly variegated, but in most places none of the colors have low chroma.

Locally, gravel may occur anywhere in the profile, or there may be a somewhat gravelly and sandy B3 horizon between the B22t and the IIC horizons. Lenses, pockets, or thin strata of clayey material are in the IIC2 horizon in places.

The Chillum soils are on the same kinds of material as the moderately well drained Beltsville soils and the more poorly drained Leonardtown soils. This material is similar but thinner and less silty than the material underlying the moderately well drained Butlertown soils. In contrast to the Chillum soils, the well drained Matapeake soils, the moderately well drained Mattapex soils, and the poorly drained Othello soils are on deposits of silt underlain by looser, sandier material.

The Chillum soils are fairly extensive in the county. They are fairly important to farming, but a large acreage is in areas of rapid development for residential use. The

native vegetation is upland hardwoods, mainly oak, but in several areas much of it is Virginia pine.

Chillum silt loam, 0 to 6 percent slopes, moderately eroded (CaB2).—This is the soil described for the Chillum series. In most areas slopes range from 2 to 6 percent. In a few scattered areas, erosion has been severe. Gullies, some of them deep, have formed in places. Included in mapping were small areas that have a surface layer containing fine sand.

Use of this soil is limited by a thin root zone, a small capacity for storing moisture, and droughtiness in long dry periods. The hazard of erosion also limits use. (Capability unit IIs–7; irrigation group 11; woodland group 7; drainage group not assigned)

Chillum silt loam, 6 to 12 percent slopes, moderately eroded (CaC2).—Except that it is more sloping and thinner, this soil is like the one described for the series. The plow layer is a mixture of the original surface soil and some of the sticky subsoil material. Some areas are uneroded or only slightly eroded, but in a few areas some gullies have formed. Included in mapping were a few places where the surface layer contains some gritty materials or fine sand.

Erosion is the most important problem of management, but seasonal droughtiness and a restricted root zone also influence management, use, and yield. Erosion can be controlled by using contour or graded strips and other conservation measures. Waterways should be kept in sod. (Capability unit IIIe–7; irrigation group 11; woodland group 8; drainage group not assigned)

Chillum silt loam, 6 to 12 percent slopes, severely eroded (CaC3).—This soil has lost most of its original surface layer through erosion. The sticky, firm plow layer is stronger brown than the original surface layer and is not so thick. The root zone and storage space for moisture are restricted. In a few places shallow gullies have formed.

Because this soil is severely eroded, shallow, and droughty, it is of little use for cultivated crops. Under exceptionally good management that provides protection from erosion, crops can be produced in a long rotation. Sod and other protective plants should be used. (Capability unit IVe–7; irrigation group 11; woodland group 17; drainage group not assigned)

Chillum silt loam, 12 to 20 percent slopes, moderately eroded (CaD2).—The surface layer of this moderately eroded soil is a mixture of the original silty surface soil and some of the sticky subsoil material. Some areas of this soil are only slightly eroded, but a few areas are severely eroded. Gullies, some of them deep, have formed in places. Included in mapping were some areas that have sandy or gravelly material in the surface layer. Also included are a few wet spots.

On this soil the hazard of erosion is severe, and cultivation is strongly restricted. Crop rotations, contour strips with diversion terraces, and sodded waterways can be used to help control erosion. (Capability unit IVe–7; irrigation group 11; woodland group 8; drainage group not assigned)

Chillum-Urban land complex, 0 to 6 percent slopes (CbB).—This complex consists of areas of Chillum soils that have been rearranged into complex patterns and are now in rural-fringe developments. Although the individual soils can be recognized, mapping them separately is impractical. About 25 percent of each area mapped as this complex consists of Chillum soils like the soils described for the Chillum series, and the rest consists of Chillum soils that have been severely disturbed or altered by man.

About 60 percent of the acreage of this complex consists of disturbed Chillum soils that are covered with as much as 18 inches of soil materials or has had as much as two-thirds of the original soil profile removed. The surface layer of these areas has variable texture and is silt loam or a mixture of sand, silt, and clay in any proportion.

About 15 percent of this unit consists of land fills, 18 inches or more in depth, or areas where most of the Chillum soil profile has been cut away. The surface layer in most places is a mixture of sand, silt, and clay in various proportions. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Chillum-Urban land complex, 6 to 12 percent slopes (CbC).—Except that slopes are steeper and the area of disturbed land is larger, this complex is like Chillum-Urban land complex, 0 to 6 percent slopes. About 15 percent of each area mapped as this complex consists of Chillum soils that have been slightly to severely eroded, and the rest consists of Chillum soils that have been severely disturbed or altered by man.

About 50 percent of the acreage consists of Chillum soils that are covered with as much as 18 inches of soil materials or have had as much as two-thirds of the original soil profile removed. About 35 percent of the acreage consists of land fills, 18 inches or more in depth, or areas where most of the Chillum soil profile has been cut away. The areas of undisturbed and severely disturbed Chillum soils are like those areas in Chillum-Urban land complex, 0 to 6 percent slopes. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Chillum-Urban land complex 12 to 35 percent slopes (CbE).—This complex is somewhat like the Chillum-Urban land complex, 0 to 6 percent slopes, but it has steeper slopes and more disturbed land. The Chillum soil in this complex have been graded, terraced, and generally rearranged for rural-fringe development. Buildings, streets, parking lots, and sidewalks occupy from 10 to 40 percent of some areas.

Less than 10 percent of each area mapped as this complex consists of Chillum soils like the soils described for the Chillum series. About 50 percent consists of Chillum soils that are covered with as much as 18 inches of soil materials or have had as much as two-thirds of the original soil profile removed. Nearly 40 percent of this complex consists of land fills, 18 inches or more in depth, or areas where most of the Chillum soil profile has been cut away. The areas of undisturbed and disturbed Chillum soils are like those areas in Chillum-Urban land complex, 0 to 6 percent slopes. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Christiana Series

The Christiana series consists of deep, well-drained silt loams, clays, and fine sandy loams on the higher part of the Coastal Plain uplands. These soils have a clay subsoil and developed in thick beds of very old red clay that, in places, are covered with a very thin mantle of silty or sandy materials. The Christiana soils are moderately

sloping or strongly sloping in most areas, but slopes range from gentle to fairly steep.

Profile of Christiana silt loam (in a wooded area on the grounds of the U. S. Department of Agriculture Research Center at Beltsville):

A1—0 to 2 inches, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; slightly hard, friable, nonsticky and nonplastic; roots abundant; very strongly acid; abrupt, smooth boundary, 1 to 2 inches thick.

A2—2 to 7 inches, yellowish-red (5YR 5/6) silt loam; weak, thin, platy and weak, fine, granular structure; slightly hard, friable, nonsticky and nonplastic; roots plentiful; very strongly acid to extremely acid; abrupt, smooth boundary. 4 to 6 inches thick.

B1—7 to 14 inches, red (2.5YR 5/6) silty clay; moderate, fine, blocky structure; hard, friable to firm, sticky and plastic; roots common; very strongly acid; gradual, smooth boundary. 6 to 8 inches thick.

B21t—14 to 30 inches, red (10R 4/6) clay; strong, fine to coarse, blocky and subangular blocky structure; very hard, firm, sticky and plastic; roots few; distinct, continuous clay coatings; very strongly acid; diffuse boundary. 14 to 20 inches thick.

B22t—30 to 60 inches, red (10R 4/6) clay; strong, fine to coarse, blocky structure; very hard, very firm, sticky and plastic; few roots in upper part; distinct, continuous clay coatings of red (10R 4/6) in upper part and of reddish brown (2.5YR 4/4) in lower part; some black (N 2/0) coats below depth of 34 inches; very strongly acid; diffuse boundary. 24 to 40 inches thick.

C—60 to 120 inches +, red (10R 4/6) clay, with many, fine, prominent streaks and variegations of pinkish gray (7.5YR 7/2); massive, or weak, very coarse, blocky structure; very hard, very firm, sticky and plastic; few black (N 2/0) patchy coatings; some broken faces are pinkish gray (5YR 7/2) or brown (7.5YR 4/4); thin coatings in cracks and on some ped faces; very strongly acid and extremely acid.

In Prince Georges County, the A horizon of Christiana soils normally is silt loam or fine sandy loam, but in severely eroded areas the Ap horizon is clay or silty clay. The B1 horizon is transitional, and the B21t and B22t horizons, as well as the C horizon, are clay in all places.

The plow layer is brown or reddish brown in uneroded areas, but it is reddish brown, weak red, or red in the severely eroded areas. The B1 horizon is red (10R 5/6). The Bt horizons have uniform color; hue is generally 10R but grades toward 2.5YR, value ranges from 3 to 5, and chroma ranges from 6 to 8. The C horizon is variable in color, and in places grades to particolored red, yellow, brown, pink, and white clay. This clay is of Cretaceous age.

The Christiana soils are on similar kinds of material as the moderately well drained Keyport soils and the poorly drained Elkton soils. Christiana soils are redder than the Sunnyside soils and contain more clay. The subsoil of Christiana soils is similar to that of Muirkirk soils, which have a thick, very sandy surface layer.

The Christiana soils are extensive in Prince Georges County. They occur mostly in the northern and western parts of the county, north of a line extending roughly between District Heights and Priest Bridge. Because of their location and distribution, these soils are becoming more important for community development than for farming. The native vegetation is upland hardwoods, mainly oak, but in some places it is Virginia pine.

Christiana clay, 5 to 10 percent slopes, severely eroded (CcC3).—This soil is typical of Christiana soils that occur in areas where all or nearly all of the original surface soil has been lost through erosion. The clay surface layer is much redder than the original surface soil of Christiana soils. In places gullies, some of them deep, have formed. Included in mapping were a few areas that have thin lenses of glauconite, or greensand, in their lower subsoil.

Because of the existing erosion and the continuing hazard of erosion, the use of this soil for cultivated crops is marginal. The soil is suited to permanent hay or pasture crops. (Capability unit IVe–3; irrigation group 14; woodland group 17; drainage group not assigned)

Christiana clay, 10 to 15 percent slopes, severely eroded (CcD3).—Except for steeper slopes, this soil is like Christiana clay, 5 to 10 percent slopes, severely eroded. In some places the surface layer contains a considerable amount of fine sand mixed with the red clay. Many gullies, some of them deep, have formed. Included in mapping were a few areas that have thin lenses of glauconite, or greensand, in their lower subsoil.

This severely eroded soil is not suitable for safe and continual cultivation. It should be kept in pasture, trees, or some other kind of permanent protective cover. (Capability unit VIe–2; woodland group 17; irrigation group and drainage group not assigned)

Christiana clay, 15 to 35 percent slopes, severely eroded (CcE3).—Except that it is on steep hillsides, this soil is like Christiana clay, 5 to 10 percent slopes, severely eroded. In some places the surface layer has some fine sand mixed with red clay, and in a few areas deep gullies have formed. Included in mapping were a few wet spots and a few very steep areas.

This steep, severely eroded soil is not suited to crops, nor even to pasture, unless grazing is carefully controlled. The surface should be well stabilized by sod or by trees, vines, or other permanent plants. (Capability unit VIIe–2; woodland group 18; irrigation group and drainage group not assigned)

Christiana fine sandy loam, 0 to 2 percent slopes (CdA).—Except that it has a fine sandy loam surface layer, this soil is like the soil described for the series. Included in mapping were a few areas where the surface layer is a mixture of the original surface soil and some of the red, sticky, clay material from the subsoil. Also included were a few spots that have thin lenses of greensand, or glauconite, in the subsoil.

This soil is difficult to work if the tools used penetrate for more than a few inches, especially if the upper part of the subsoil is dry and hard. If the soil is worked when wet, the surface layer and subsoil compact and become very hard when they dry. (Capability unit IIs–28; irrigation group 5; woodland group 7; drainage group not assigned)

Christiana fine sandy loam, 2 to 5 percent slopes, moderately eroded (CdB2).—Except that it is coarser textured and somewhat thinner, this soil is like the soil described for the series. The risk of erosion is moderate. Some areas are uneroded, and some are severely eroded. Included in mapping were a few areas where shallow gullies have formed, a few spots where the surface layer is somewhat coarser than normal, and some areas where lenses of greensand, or glauconite, occur in the lower subsoil.

Because the clay in the subsoil absorbs water slowly, runoff is moderately rapid and erosion is likely after the sandy surface layer is saturated. Special practices are needed for controlling erosion. (Capability unit IIe–41; irrigation group 5; woodland group 7; drainage group not assigned)

Christiana fine sandy loam, 5 to 10 percent slopes, moderately eroded (CdC2).—This sloping soil is very susceptible to erosion because the surface soil is sandy and the subsoil is clay. Some areas are uneroded, and a few are only slightly eroded. Included in mapping were areas where the surface layer contains coarse sand. Also included were a few areas that have thin layers of greensand, or glauconite, in the subsoil.

Because the clay subsoil absorbs water slowly, runoff is moderately rapid after the sandy surface layer is saturated. Intensive practices are needed to control erosion. (Capability unit IIIe–41; irrigation group 5; woodland group 8; drainage group not assigned)

Christiana fine sandy loam, 10 to 15 percent slopes, moderately eroded (CdD2).—Because this strongly sloping soil has a sandy surface soil and a clay subsoil, the erosion hazard is serious. Some areas, however, are uneroded or only slightly eroded. Included in mapping were a few places having a surface layer that is coarser textured than fine sandy loam. Also included were a few spots that have thin lenses of greensand, or glauconite, in their profile.

This soil can be used for cultivated crops, if a long rotation is used and a cultivated crop is grown only occasionally. It can also be used for hay, pasture, or other less intensive uses. (Capability unit IVe–5; irrigation group 5; woodland group 8; drainage group not assigned)

Christiana silt loam, 0 to 2 percent slopes (CeA).—This is the soil described for the Christiana series. Included in mapping were a few areas where the surface layer is a mixture of the original surface soil and some of the sticky, red clay material from the subsoil. Also included were areas that have some fine sand mixed with the surface soil and small areas that have thin lenses of greensand, or glauconite, in the profile.

This soil is fairly difficult to work, even where it has not been compacted by heavy machinery. (Capability unit IIs–29; irrigation group 12; woodland group 7; drainage group not assigned)

Christiana silt loam, 2 to 5 percent slopes, moderately eroded (CeB2).—Except that its surface layer is thinner, this soil is like the one described for the Christiana series. Because slopes are gentle, the risk of erosion is moderate. Some areas are uneroded, and a few are severely eroded. Gullies, a few of them deep, have formed in some fields. Included in mapping were small areas where the surface layer contains fine sand. Also included were some areas that have thin lenses of greensand, or glauconite, in the subsoil.

Runoff tends to be rapid because water moves through this soil slowly. Tillage should be kept to a minimum. Runoff and erosion can be controlled by using graded contour strips, sodded waterways, and diversion terraces on long slopes. (Capability unit IIe–42; irrigation group 12; woodland group 7; drainage group not assigned)

Christiana silt loam, 5 to 10 percent slopes, moderately eroded (CeC2).—The surface layer of this soil is dominantly silt loam, but in places it contains an appreciable amount of fine sand. Some areas are uneroded or only slightly eroded. Included in mapping were a few areas that have greensand, or glauconite, in the subsoil.

Intensive erosion control measures are needed if cultivation is continued on this soil. (Capability unit IIIe–42; irrigation group 12; woodland group 8; drainage group not assigned)

Christiana silt loam, 10 to 25 percent slopes, moderately eroded (CeD2).—Except that it is steeper, this soil is like Christiana silt loam, 2 to 5 percent slopes, moderately eroded. Some areas are uneroded or only slightly eroded. In places the surface layer contains an appreciable amount of fine or coarse sand. Included in mapping were a few areas where shallow gullies have formed and some smaller areas that have slopes of more than 25 percent.

This soil is too steep for regular cultivation. It can be planted to cultivated crops once in 5 years if protective rotations and other conservation measures are used. (Capability unit IVe–3; irrigation group 12; woodland group 8; drainage group not assigned)

Christiana-Urban land complex, 0 to 5 percent slopes (CfB).—This complex consists of the more nearly level Christiana soils and disturbed land that is mainly of Christiana soil material. These areas are in community developments. These soils have been disturbed and altered. Although the individual soils can be recognized, mapping them separately is impractical. About 20 percent of each area mapped as this complex consists of Christiana soils similar to the soil described for the series. About 50 percent consists of severely disturbed Christiana soils that are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. In these severely disturbed areas, the surface layer is a mixture of sand, silt, and clay in any proportion.

About 30 percent of this unit consists of land fills that are 18 inches or more thick and of areas where most of the Christiana soil profile has been cut away. The surface layer is a mixture of sand, silt, and clay in various proportions, or it is red clay that is very sticky when wet. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Christiana-Urban land complex, 5 to 15 percent slopes (CfC).—This complex is steeper than Christiana-Urban land complex, 0 to 5 percent slopes, and it contains more disturbed land. The Christiana soils have been graded, terraced, or generally rearranged for community development. Buildings, streets, and sidewalks occupy from 10 to 40 percent of the mapping unit.

About 10 percent of each area mapped as this complex consists of Christiana soils like the soil described for the series. About 50 percent consists of Christiana soils that have been severely disturbed or altered by machines. In these areas the severely disturbed Christiana soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. Nearly 40 percent of the acreage consists of land fills, 18 inches or more thick, or areas where most of the Christiana soil profile has been cut away. The surface layer of the severely disturbed areas has variable texture and may be a mixture of sand, silt, and clay in any proportion. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Christiana-Urban land complex, 15 to 40 percent slopes (CfE).—This complex is steeper than Christiana-Urban land complex, 0 to 5 percent slopes, and it contains more disturbed land. Except in the very steep areas, this complex has been severely graded, terraced, and rearranged for community developments. Buildings, streets, parking lots, and sidewalks occupy from 10 to 40 percent of some mapped areas.

Less than 10 percent of each area mapped as this complex consists of Christiana soils like the soil described for the series. About 45 percent consists of Christiana soils that have been severely disturbed or altered by machines. Here the Christiana soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. Nearly 45 percent of this complex consists of land fills, 18 inches or more thick, or areas where most of the Christiana soil profile has been cut away. The surface layer of the severely disturbed Christiana soils has variable texture and may be red clay or a mixture of sand, silt, and clay in any proportions. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Clay Pits

This miscellaneous land type consists of areas that have been disturbed by digging clay for making bricks and other clay products.

Clay pits (Cg).—This mapping unit consists of excavations from which clay has been mined. Most of the clay is very fine and of Cretaceous age. This clay is fairly extensive in the northwestern part of the county and underlies the Christiana, Muirkirk, and other clayey soils in that general area. At Muirkirk the clay has been used extensively for making brick.

Unless these pits are reclaimed, they can be used only for mining clay. The feasibility of reclamation depends on the conditions at each site and the objectives of the reclamation. (Capability unit VIIIs–4; woodland group, irrigation group, and drainage group not assigned)

Codorus Series

In the Codorus series are moderately well drained soils that occur mainly on the flood plain of streams of the Piedmont along the northwestern edge of the county. In some places they extend along the major streams into the Coastal Plain. The Codorus soils consist of recently deposited materials that washed from soils developed from acid crystalline rocks of the Piedmont. In most places these soils contain a considerable amount of fine mica. They are nearly level to very gently sloping.

Profile of Codorus silt loam (on the wooded flood plain of the Patuxent River in the Patuxent Research Refuge):

A1—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable, slightly sticky but nonplastic; roots abundant; few mica flakes and fine pores; strongly acid; clear, smooth boundary. 6 to 8 inches thick.

C1—8 to 19 inches, dark yellowish-brown (10YR 4/4) silt loam; massive; weakly stratified; friable, slightly sticky but nonplastic; roots plentiful; common fine flakes of mica; strongly acid; clear, smooth boundary. 8 to 12 inches thick.

C2—19 to 34 inches, dark yellowish-brown (10YR 4/4) silt loam; common, medium, distinct mottles of grayish brown (2.5Y 5/2); massive; somewhat stratified; friable, slightly sticky and slightly plastic; few roots; common fine flakes of mica; strongly acid; clear, smooth boundary. 12 to 16 inches thick.

C3—34 to 60 inches +, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct mottles of dark yellowish brown (10YR 4/4); stratified; friable, slightly sticky and very slightly plastic; abundant fine flakes of mica; strongly acid.

In Prince Georges County, all soils of the Codorus series are silt loams. In some places they are slightly more reddish than the soil described for the series. The depth to mottling ranges from about 15 to 25 inches. In many places clayey or sandy material that contains much waterworn gravel underlies these soils at a depth of 4 feet or more.

The water table is seasonally high; it is seldom much below a depth of 4 feet, even in long dry periods. In most places artificial drainage is not difficult, but flooding is likely.

The Codorus soils formed from the same general kinds of material as the well-drained Comus soils and the poorly drained Hatboro soils. Although Codorus soils are somewhat similar to Iuka soils, the Iuka soils formed on old sediments of the Coastal Plain and do not contain fine mica flakes.

The Codorus soils are of moderate extent in Prince Georges County. They occur chiefly on the flood plains of the Patuxent River, Paint Branch, and Northwest Branch near the Montgomery County line. These soils are suited to many crops if they are drained and protected from flooding. They are perhaps more useful for parks, wildlife habitats, playgrounds, and other recreational uses because they are mainly near the expanding residential areas of the county. The native vegetation is chiefly maple, gum, birch, water-tolerant oak, and other wetland hardwoods.

Codorus silt loam (Ch).—This is the soil described for the Codorus series. It occurs mainly on the flood plain of the Patuxent River and is also along many smaller streams north and west of Bladensburg. The surface layer feels floury when it is dry but is somewhat sticky when it is wet. Most areas of this soil are nearly level, but a few areas have slopes of as much as 5 percent.

General farm crops, hay, and pasture can be grown on this soil, but use is limited by impeded drainage and local floods. The cropping sequence should include hay and pasture crops. Drainage is improved by using either open ditches or tile. In the more sloping areas, runoff and the hazard of erosion can be reduced by farming in graded strips and using sodded waterways. (Capability unit IIw–7; drainage group 5; irrigation group 10; and woodland group 29)

Codorus-Urban land complex (Ck).—This complex consists of Codorus soils that are in community developments. Most areas are nearly level but a few are gently sloping.

About 25 percent of each area mapped as this complex consists of a soil like the one described for the Codorus series; about 55 percent consists of Codorus soils that have been covered with sand, silt, or clay to a depth of 6 to 18 inches. The rest consists of areas of Codorus soil that have been covered with fill more than 18 inches thick. Here the surface layer is a variable mixture of sand, silt, and clay.

This complex has been covered by fill material so that buildings, streets, parking lots, and playgrounds can be constructed, but in most areas the fills have not greatly reduced the hazard of flooding. (Drainage group 5; capability unit, irrigation group, and woodland group not assigned)

Colemantown Series

The soils of the Colemantown series are poorly drained and have an olive to greenish-colored clay subsoil through which water moves slowly. These soils developed in clayey materials that contain a considerable amount of green-

sand. They occur on nearly level upland flats, mainly in the central part of the county.

Profile of Colemantown loam (in a cultivated field on the north side of Central Avenue, east of Kolbes Corner) :

Ap—0 to 11 inches, olive-brown (2.5Y 4/4) loam; common, fine, prominent mottles of yellowish red (5YR 4/8) and a few, fine, distinct mottles of olive (5Y 4/3); weak, fine, granular structure; hard, friable, slightly sticky but nonplastic; roots plentiful; medium acid and strongly acid; abrupt, smooth boundary. 10 to 12 inches thick.

B2tg—11 to 29 inches, dark olive-green (5GY 3/2) clay; common, fine and medium, prominent mottles of dark red (2.5YR 3/6); strong, medium, blocky structure; hard, friable to firm, sticky and plastic; roots common; continuous silt or clay coats of dark olive gray (5Y 3/2) with a slightly greenish cast; very high content of glauconite; extremely acid; clear, smooth boundary. 15 to 21 inches thick.

B3g—29 to 36 inches, dark olive-gray (5Y 3/2) fine sandy clay; common, medium, prominent mottles of strong brown (7.5YR 5/8); weak, thick, platy and weak, coarse, blocky structure; friable to firm, plastic and slightly sticky; very few roots; discontinuous clay coatings; very high content of glauconite; low bulk density; extremely acid; gradual, smooth to diffuse boundary. 6 to 8 inches thick.

Cg—36 to 60 inches +, variegated dark olive-gray (5Y 3/2) and dark olive-green (5GY 3/2) fine sandy clay; common, coarse, prominent mottles of strong brown (7.5YR 5/8); massive; low bulk density; friable, plastic and slightly sticky; extremely acid.

The B horizon is clay, sandy clay, or silty clay, and the C horizon ranges from loam to clay and is stratified in places. Thin strata or fragments of ferruginous sandstone (ironstone) may occur in the B3 and C horizons.

In undisturbed areas there are a thin, dark grayish-brown to dark-gray A11 horizon and a somewhat thicker, somewhat lighter colored A12 horizon. The B and C horizons have a hue of 5Y, 5GY, or 5G in that order, as the amount of glauconite increases. Mottling in the B and C horizons has a hue ranging from 2.5YR to 5Y, a value generally of 3 to 5, and a chroma that is low in places but normally ranges from 6 to 8. In the B and C horizons, the value of the matrix is generally 3 but is 4 or 5 in places; the chroma of the matrix is 2 or 3.

The solum of the Colemantown soils ranges from about 28 to 40 inches in thickness. The content of glauconite ranges from about 10 to 70 percent, and in most places increases with depth.

The Colemantown soils are on the same general kind of material as the well drained Monmouth and the moderately well drained Donlonton soils. The Colemantown soils are similar to the Shrewsbury but are less sandy throughout. They are less dense and compact than the Elkton soils, which are gray instead of olive to greenish colored.

The Colemantown soils are of limited extent in Prince Georges County. They occur in small scattered areas in the central part. The native vegetation is hardwoods that tolerate wetness.

Colemantown loam (Cl).—Included with this nearly level soil in mapping were some areas where there is a fairly large amount of fine or coarse sand in the surface layer. Also included were a few areas where the surface layer is silt and feels soft and floury.

Wetness is the most important problem in managing this soil. Except in areas that contain much sandy material, the soil is difficult to drain or to work. For drainage systems, ditches are more practical than tile. If this soil is adequately drained, it is suited to corn, soybeans, and some hay and pasture plants. Erosion is not a problem on this soil. Row crops can be grown for several successive years, provided a cover crop is seeded after a row crop is harvested or if this soil is allowed to remain fallow every few years. (Capability unit IIIw–7; drainage group 8–2B; irrigation group 12; and woodland group 1)

Collington Series

The Collington series consists of deep, well-drained soils that developed in sandy materials containing a moderate amount of greensand. These soils occur on uplands that are generally nearly level to rolling but are steep in places. The areas are large and are mainly in the central part of the county.

Profile of Collington silt loam (in a wooded area on Enterprise Road, about four-tenths of a mile south of U.S. Highway No. 50) :

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, coarse, granular structure; loose, nonsticky and nonplastic; roots abundant; medium acid; clear, smooth boundary. 2 to 3 inches thick.

A2—2 to 13 inches, dark-brown (10YR 3/3) silt loam; weak, coarse, granular structure; soft, friable, slightly sticky and slightly plastic; roots plentiful; medium acid; clear, wavy boundary. 8 to 12 inches thick.

B21t—13 to 24 inches, brown or dark-brown (7.5YR 4/4) fine sandy clay loam; moderate, coarse, subangular blocky structure; hard, friable to firm, sticky and slightly plastic; roots common; distinct, discontinuous clay coats; medium acid; gradual, wavy boundary. 8 to 12 inches thick.

B22t—24 to 42 inches, brown or dark-brown (7.5YR 4/4) heavy sandy clay loam; strong, coarse, subangular blocky structure; hard, firm, sticky and plastic; very few roots; distinct and prominent, almost continuous, dark reddish-brown (5YR 3/4) coats and accumulations of clay; strongly acid; gradual, irregular boundary. 15 to 25 inches thick.

B3—42 to 52 inches, dark yellowish-brown (10YR 4/4) heavy sandy loam; weak, coarse, subangular blocky structure; hard, friable, slightly sticky but nonplastic; few, faint, discontinuous, brown or dark-brown (7.5YR 4/4) clay films; very strongly acid; gradual, irregular boundary. 5 to 15 inches thick.

C—52 to 120 inches +, yellow (10YR 7/6) loamy sand mixed with dispersed grains of dark-olive (5Y 3/3) glauconite (greensand) amounting to about 35 percent of soil mass; overall color is yellowish brown (10YR 5/4); single grain; loose; very slightly sticky but nonplastic; very strongly acid.

The surface layer is loamy fine sand, fine sandy loam, or silt loam. The surface layer and subsurface layer combined range from about 10 to 20 inches or more in thickness. The surface layer generally is thickest where it is loamy fine sand. The subsoil is a little yellower or somewhat redder than it is in the soil described. In places older gravelly deposits are at a depth of 5 feet or more, and in a few places fine smooth gravel occurs at variable depths.

Except for the disposal of runoff, excess water is not a problem in the Collington soils. Water moves readily through these soils, and the water table is at a great depth. The Collington soils have a moderate moisture-holding capacity and are moderately or highly productive under good management. They are medium acid to very strongly acid, unless they have been limed. The Collington soils generally are well suited to many uses, but use is limited in the more sloping areas. These soils are especially well suited to tobacco.

Where runoff is removed safely, the Collington soils are suitable for the foundations of buildings, for road grades, and for other nonfarm uses. The more nearly level areas are good sites for disposing of effluent from

septic tanks, but areas that have slopes between about 5 and 15 percent are of doubtful suitability because pollution downslope is likely. Areas that have slopes of more than 15 percent should not be used for disposing of sewage effluent.

The Collington are on the same kinds of material as the moderately well drained Adelphia soils and the poorly drained Shrewsbury soils. The Collington are not so brightly colored as the Sassafras soils, which do not contain greensand. The Collington soils developed in materials that contain less greensand than those of the Monmouth soils.

In contrast to the Collington soils, the Monmouth soils have strong-olive colors and a finer textured subsoil.

The Collington are among the most extensive soils in Prince Georges County and are dominant in most of the central part. They are highly important for farming and for rapidly expanding community developments. The native vegetation is mixed upland hardwoods and some Virginia pine.

Collington fine sandy loam, 0 to 2 percent slopes (CmA).—This soil is typical of the Collington soils that occur in areas where the surface layer is fine sandy loam. In places this layer contains a considerable amount of coarse sand. Included in mapping were gravelly spots. Also included were a few areas that are severely eroded and areas where shallow gullies have formed.

This soil is well suited to general crops and to deep-rooted crops. It is among the best soils in Maryland for tobacco, especially high-quality tobacco. This soil is easy to work, has a good moisture-holding capacity, and is highly productive under good management. Erosion or excess water is not a hazard. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Collington fine sandy loam, 2 to 5 percent slopes, moderately eroded (CmB2).—This is one of the most extensive well-drained soils of the uplands in the county. The risk of erosion is moderate. In some places this soil is shallower than normal to the underlying sandy materials, and in a few areas the surface layer contains some sticky subsoil material. Included in mapping were areas that are uneroded or only slightly eroded and a few areas where gullies have formed, some of them fairly deep. Also included were some areas where the surface layer contains coarse sand.

The soil is well suited to most general crops and to deep-rooted crops. If it is properly managed, it produces favorable yields of truck crops, corn, small grain, hay, and pasture. Yields of tobacco are also favorable. The moisture-holding capacity is good. Crop rotations, winter cover crops, and contour strips are needed to protect this soil from erosion. Waterways should be kept in sod. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Collington fine sandy loam, 5 to 10 percent slopes, moderately eroded (CmC2).—This sloping soil is somewhat thinner than Collington fine sandy loam, 0 to 2 percent slopes, and is more likely to be severely damaged by erosion. In places the surface layer contains some subsoil material, and in a few places shallow gullies have formed. Included in mapping were a few areas where the surface layer contains coarse sand.

The use of this soil for farming is limited, but in some well-managed areas tobacco of high quality is produced. This soil holds a good supply of moisture available for plants. Rotations, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Collington fine sandy loam, 5 to 10 percent slopes, severely eroded (CmC3).—This soil is so severely eroded that the surface layer consists mostly of the brown, sticky subsoil material. Gullies, some of them fairly deep, have formed in places. Included in mapping were areas where the surface layer contains coarse sand. Also included were a few gravelly spots.

Use of this soil for cultivated crops is marginal, but permanent hay and pasture can be grown safely. Protection from erosion is provided by rotations, contour cultivation, contour stripcropping with buffer strips, residue management, and minimum tillage. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Collington fine sandy loam, 10 to 15 percent slopes, moderately eroded (CmD2).—This strongly sloping soil erodes readily if it is cultivated and conservation measures are not adequate. A few areas are only slightly eroded. Included in mapping were areas where shallow gullies have formed. Also included were a few gravelly spots and some areas where the surface layer is silty or sandy.

This soil can be used for a cultivated crop if the crop is grown only occasionally in a long rotation. Hay or pasture is a less intensive use. (Capability unit IVe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Collington fine sandy loam, 10 to 15 percent slopes, severely eroded (CmD3).—This soil is thinner than Collington fine sandy loam, 0 to 2 percent slopes, because most of the original surface soil has been lost through the erosion that occurred during many years of continuous cultivation. The plow layer is a mixture of the original surface soil and the brown, sticky, subsoil material. Gullies, some of them deep, have formed in places. Included in mapping were a few areas of somewhat wet soils that have a sandy surface layer.

Sod or other protective plants should be used to protect this soil, for it is not suitable for cultivated crops. If management is good, a safe use is hay or pasture. (Capability unit VIe–2; woodland group 13; irrigation group and drainage group not assigned)

Collington fine sandy loam, 15 to 40 percent slopes, moderately eroded (CmE2).—This soil is on steep and very steep hillsides. Some areas are only slightly eroded, and a few areas are severely eroded. In some places shallow gullies have formed. Included in mapping were a few areas where the surface layer is slightly sandier or siltier than normal. Also included were some areas that have olive-green, very sticky, glauconitic clay in their subsoil.

Most areas of this soil are wooded and should remain so. The cleared areas can be managed for limited grazing or forage, or they can be replanted in trees. (Capability unit VIe–2; woodland group 9; irrigation group and drainage group not assigned)

Collington fine sandy loam, 15 to 30 percent slopes, severely eroded (CmE3).—This steep Collington soil is

very thin to the underlying sandy layers. The surface layer is a mixture of the original surface soil and much material from the subsoil. Gullies, some of them deep, have formed in places. Included in mapping were a few areas where the surface layer is a little sandier or siltier than normal.

This steep, severely eroded soil is not suited to cultivated crops. It is suited to trees. If overgrazing is prevented, some forage can be produced. (Capability unit VIIe–2; woodland group 13; irrigation group and drainage group not assigned)

Collington loamy fine sand, 0 to 5 percent slopes, moderately eroded (CnB2).—This soil is typical of the Collington soils that occur in areas where the surface layer is loamy fine sand. The surface layer tends to be thicker than that of Collington soils having a texture other than loamy sand. In many places the surface layer is 20 inches thick or more. Some areas are uneroded or only slightly eroded. Included in mapping were a few areas where shallow gullies have formed. Also included were severely eroded areas.

This soil is highly desirable for growing tobacco and some other crops because it is easily worked and warms quickly in spring. Its capacity to hold moisture, however, is lower than that of the finer textured Collington soils. Sandiness is a limitation in general farming. The hazard of erosion is slight. (Capability unit IIs–4; irrigation group 3; woodland group 7; drainage group not assigned)

Collington loamy fine sand, 5 to 10 percent slopes, moderately eroded (CnC2).—Because this soil has a sandy surface layer and is sloping and strongly sloping, the erosion hazard is high. In some areas erosion is severe and the sandy surface layer is mixed with brown subsoil material. A few shallow gullies have formed in some fields.

This sandy soil requires somewhat different management than is required on the less sandy Collington soils that have about the same slopes and degree of erosion. On this soil, management is needed that conserves moisture and controls erosion. (Capability unit IIIe–33; irrigation group 3; woodland group 8; drainage group not assigned)

Collington loamy fine sand, 10 to 15 percent slopes, moderately eroded (CnD2).—This soil has a thinner surface layer than the soil described for the Collington series because more of its sandy surface layer has been removed by erosion. Included in mapping were severely eroded areas and a few areas where shallow gullies have formed.

Erosion is the main problem of management. Cultivation should be limited, and the surface protected by plants most of the time. (Capability unit IVe–5; irrigation group 3; woodland group 8; drainage group not assigned)

Collington silt loam, 0 to 2 percent slopes (CoA).—This soil is the one described for the Collington series. Its surface layer generally feels soft and floury, but in places it contains some gritty material.

This soil is well suited to general crops and to deep-rooted crops. It produces economic yields of tobacco, but the tobacco may not be of such high quality as that produced on Collington soils having a sandier surface layer. This soil holds a good supply of moisture available for plants. (Capability unit I–4; irrigation group 13; woodland group 7; drainage group not assigned)

Collington silt loam, 2 to 5 percent slopes, moderately eroded (CoB2).—This soil slopes enough for the risk of erosion to be moderate. The surface layer is silt loam and feels soft or floury, but in some places, it contains gritty material. Some areas of this soil are uneroded or only slightly eroded.

This soil is well suited to most general crops and produces favorable yields of tobacco. Crop rotations should include hay for at least 1 year in 3 or 4. Contour strips are needed in all fields that have long slopes, and waterways should be kept in sod. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Collington silt loam, 5 to 10 percent slopes, severely eroded (CoC3).—This soil is thinner or shallower to the underlying material than the soil described for the Collington series. Most of the original surface soil has been removed through erosion, and the surface layer now contains much subsoil material. Gullies have formed in some places. Included in mapping were a few areas where the soil has gritty material in the surface layer.

This soil is suited to general crops, but safe cultivation is marginal. Conservation practices needed to control erosion are contour cultivation, stripcropping, minimum tillage, and terracing where needed. Waterways should be kept in sod. (Capability unit IVe–3; irrigation group 13; woodland group 13; drainage group not assigned)

Collington-Urban land complex, 0 to 5 percent slopes (CpB).—This complex consists of nearly level to gently sloping Collington soils and disturbed land that is mainly of Collington soil material. These areas are used for community developments. The soils have been rearranged into complex patterns. Although the individual soils can be recognized, mapping them separately is impractical. About 20 percent of each area mapped as this complex is made up of undisturbed Collington soils. The rest consists of Collington soils that have been severely disturbed or altered by machines.

About 50 percent of the acreage of Collington soils has been covered with as much as 18 inches of soil material or has had as much as two-thirds of the original soil profile removed. The surface layer of these areas has variable texture and may be fine sandy loam, silt loam, or a mixture of sand, silt, and clay in any proportion.

About 30 percent of this unit consists of land fills, 18 inches or more in depth, or places where most of the Collington soil has been cut away. The surface layer is either a mixture of sand, silt, and clay in various proportions, or it is loose, yellowish sandy material that contains some greensand, or glauconite. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Collington-Urban land complex, 5 to 15 percent slopes (CpC).—Except for steeper slopes, this complex is like Collington-Urban land complex, 0 to 5 percent slopes. The Collington soils in this complex have been graded, terraced, and generally rearranged for community developments. Buildings, streets, and sidewalks occupy from 10 to 40 percent of the complex.

About 15 percent of each area mapped as this complex consists of Collington soils that have been slightly to severely eroded; and the rest consists of Collington soils that have been severely disturbed or altered by machines.

In about 55 percent of the acreage, the Collington soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the soil profile removed. About 30 percent of this unit consists of land fills, 18 inches or more in depth, or places where the Collington soil profile has been cut away. The surface layer

of these severely disturbed Collington soils has variable texture and may be a mixture of sand, silt, and clay in any proportions. In places this sandy material may contain greensand, or glauconite. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Comus Series

The Comus series consists of deep, well-drained soils on flood plains. These soils are mainly along streams in the Piedmont, but they also extend along the major streams in the Coastal Plain. The material of the Comus soils was recently deposited. It contains a considerable amount of finely divided mica, for it washed from soils developed from weathered, acid crystalline rock. Most areas of Comus soils are nearly level, but some are very gently sloping.

Profile of the Comus silt loam (on the wooded flood plain in the Patuxent Research Refuge):

A11—0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable, slightly sticky but nonplastic; roots plentiful; fine mica; very strongly acid; clear, smooth boundary. 1 to 2 inches thick.

A12—1 to 8 inches, brown or dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable, slightly sticky and very slightly plastic; roots plentiful; fine mica; many worm channels; very strongly acid; abrupt, smooth boundary. 7 to 8 inches thick.

C1—8 to 32 inches, brown or dark-brown (7.5YR 4/4) micaceous loam; single grain to weakly stratified; very friable, slightly sticky but nonplastic; roots common in upper part, few in lower part; content of mica increases rapidly with depth; very strongly acid; abrupt, smooth boundary. 22 to 28 inches thick.

IIC2—32 to 60 inches +, brown or dark-brown (7.5YR 4/4) gravely sandy loam; stratified; friable, nonsticky and nonplastic; abundant fine to coarse flakes of mica; very strongly acid.

In Prince Georges County, the Comus soils consist of silt loams underlain by coarser material. In places they are slightly redder than the soil described, and some gray mottling may occur at a depth of 30 to 36 inches. Sandy or gritty materials occur as very thin layers in the profile or as recent deposits on the surface.

The Comus soils are not excessively wet internally. They are well drained, and their water table generally is at a depth of 6 feet deep or more. Also, surface water normally drains away quickly. Flooding by streams, however, is a hazard, though floods are not so frequent nor so damaging as those on the nearby Codorus and Hatsboro soils. The Comus soils naturally are medium acid and strongly acid. They are permeable and have moderate to high moisture-holding capacity.

The Comus soils are of the same general kinds of material as the moderately well drained Codorus soils and the poorly drained Hatboro soils. They are similar in many ways to the Ochlockonee soils of the Coastal Plain, but those soils consist of materials that washed from soils developed in old sediments and do not contain the fine mica.

The Comus soils are of minor extent in Prince Georges County. They are almost unused for farming, though under good management, they produce favorable yields, especially of corn. They are excellent for parks, playgrounds, and wildlife areas. The Comus soils support excellent stands of hardwoods, mostly of oak, but also of yellow-poplar, maple, hickory, and black walnut.

Comus silt loam (Cr).—This well-drained soil occurs mostly on the flood plain of the Patuxent River. In some places, thin layers of sandy or gritty materials have been deposited on the surface. The natural fertility and available moisture capacity are high. This soil is suited to a wide range of crops. (Capability unit I–6; irrigation group 10; woodland group 29; drainage group not assigned)

Croom Series

The Croom series consists of somewhat excessively drained gravelly soils that have a yellowish-brown subsoil and are only moderately deep to a very gravelly, very hard and firm layer. These soils have developed on old deposits of sandy and clayey gravel. The Croom soils are sloping to very steep and are mainly in the western and northwestern parts of the county.

Profile of Croom gravelly sandy loam (in a wooded area about one-half mile south of Cheltenham):

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) gravelly sandy loam; weak, fine, granular structure; loose; strongly acid; gradual, smooth boundary. 1 to 2 inches thick.

A21—2 to 7 inches, grayish-brown (2.5Y 5/2) gravelly sandy loam; weak, fine, granular structure; friable; roots fairly plentiful; strongly acid; clear, smooth boundary. 3 to 5 inches thick.

A22—7 to 12 inches, pale-yellow (2.5Y 7/4) gravelly sandy loam; very weak, fine, granular structure; very friable; roots common; strongly acid; abrupt, smooth boundary. 5 to 6 inches thick.

B2t—12 to 28 inches, yellowish-brown (10YR 5/6) very gravelly sandy clay loam of which about 60 percent is gravel; massive; extremely hard, very firm, sticky and plastic; a few roots in upper part but none below a depth of 16 inches; distinct, dark yellowish-brown (10YR 4/4) and prominent, strong-brown (7.5YR 5/8) clay coats on pebbles; strongly acid; clear, wavy boundary. 12 to 20 inches thick.

B3—28 to 48 inches, variegated yellowish-brown (10YR 5/4), strong-brown (7.5YR 5/8), and yellowish-red (5YR 5/8) very gravelly sand or loamy sand, of which about 75 to 90 percent is gravel; massive; very hard, very firm, slightly sticky and slightly plastic; some pebbles in upper part coated with strong brown (7.5YR 5/8); medium acid and strongly acid; diffuse boundary. 1 to 8 feet thick.

C—48 to 120 inches +, stratified yellowish-brown (10YR 5/4) and light brownish-gray (10YR 6/2) sandy gravel and gravelly sand; loose to somewhat firm in place; very strongly acid.

The A horizon is either gravelly sandy loam or gravelly loam. In the B2t horizon, the content of clay ranges from 20 to 35 percent, and the content of gravel ranges from about 50 to 75 percent. The B3 horizon is very gravelly sand, loamy sand, or sandy gravel. It contains a small amount of clay but very little silt. The boundary between the B3 and the C horizons is difficult to locate. The solum of the Croom soils ranges from about 30 inches to as much as 120 inches in thickness, mainly because of the wide range in thickness of the B3 horizon.

In cultivated areas the plow layer is grayish brown to pale brown. The B2t horizon is yellowish brown, 10YR, and has a chroma of 6 or 8, but in places it is brownish yellow and may be streaked with strong brown. The B3 and the C horizons are commonly variegated and may have a higher value and a lower chroma than the B2t horizon.

The Croom soils are on the same general kinds of material as the Aura soils, which are similar to the Croom soils but are dominantly redder. The Croom soils contain a little less clay than the Aura soils and are more excessively drained. The Croom soils occur with the less gravelly, moderately well drained Beltsville soils and

with the gravelly Sassafras soils, which are deeper and looser than the Croom soils.

The Croom soils are fairly extensive in Prince Georges County but are used little for farming. Most cultivated areas are used for tobacco. Some areas are used for community developments. Many areas provide gravel for highway construction and for other purposes. The native vegetation is mostly Virginia pine and scrub hardwoods.

Croom gravelly loam, 3 to 8 percent slopes, moderately eroded (CsB2).—This soil is typical of Croom soils that occur in areas having a gravelly loam surface layer. In places this layer is shallow to the very hard and firm, gravelly and sandy clay material. Included in mapping were some areas that are uneroded and a few areas that are severely eroded.

Droughtiness, caused by the thin root zone, is the main limitation to use, but the hazard of erosion is also a problem. (Capability unit IIs–7; irrigation group 11; woodland group 12; drainage group not assigned)

Croom gravelly loam, 8 to 15 percent slopes, moderately eroded (CsC2).—This soil is more sloping than Croom gravelly loam, 3 to 8 percent slopes, moderately eroded, and more susceptible to erosion. In some places erosion is only slight, but in other areas shallow gullies have formed.

Erosion is the most important problem of management, but seasonal droughtiness and a restricted root zone also affect management, use, and crop yields. Contour tillage or graded strips are needed to control erosion. Waterways should be kept in sod. (Capability unit IIIe–7; irrigation group 11; woodland group 16; drainage group not assigned)

Croom gravelly loam, 8 to 15 percent slopes, severely eroded (CsC3).—This soil is on moderately sloping hillsides. It has lost most of its original surface soil through erosion, and only a few inches of gravelly loam is left on the hard, firm subsoil. In some places shallow gullies have formed. Included in mapping were a few areas where the surface layer is firm gravelly sandy clay.

This soil is so shallow, droughty, and susceptible to erosion that it is of little use for cultivated crops. Under exceptionally good management and protection, however, it can produce some crops if a long rotation is used that includes sod, or other highly protective plants. (Capability unit IVe–7; irrigation group 11; woodland group 17; drainage group not assigned)

Croom gravelly sandy loam, 3 to 8 percent slopes, moderately eroded (CtB2).—This soil is like the one described for the Croom series. Included in mapping are some areas that have slopes of less than 3 percent and are only slightly eroded. A few areas are severely eroded, and shallow gullies have formed in some places. Also included were some spots that have a silty subsoil, some that have impeded drainage, and some that have a redder surface layer than is normal for the series.

This soil is droughty and does not hold plant nutrients well. The hard, dense, very gravelly subsoil limits the thickness of the root zone. Contour cultivation is needed to conserve moisture and to control erosion. (Capability unit IIs–9; irrigation group 9; woodland group 12; drainage group not assigned)

Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded (CtC2).—The erosion hazard on this moderately sloping soil is high and most areas have lost some of the original surface soil. In some places the subsoil is redder than normal. Included in mapping were a few areas that have shallow gullies. Also included were a few spots that have a silty subsoil and impeded drainage.

Although this soil is droughty and does not hold plant nutrients well, the control of erosion is probably the most important problem of management. (Capability unit IIIe–9; irrigation group 9; woodland group 16; drainage group not assigned)

Croom gravelly sandy loam, 8 to 15 percent slopes, severely eroded (CtC3).—Except that it has lost most of its original surface layer, this soil is like Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded. The surface layer is very shallow to the hard gravelly subsoil. Many gullies, some of them fairly deep, have formed in some places. Included in mapping were a few areas that have a somewhat silty subsoil and wet spots.

This soil is not generally suited to cultivated crops, but a row crop can be used occasionally in a long rotation if good management and intensive conservation are used. (Capability unit IVe–7; irrigation group 9; woodland group 17; drainage group not assigned)

Croom gravelly sandy loam, 15 to 25 percent slopes, moderately eroded (CtD2).—This steep gravelly soil occurs mostly in the southern part of the county. The surface layer is somewhat thin and is underlain by a hard gravelly layer. In some areas the soils are only slightly eroded, but in a few places shallow gullies have formed. Included in mapping were a few areas where the subsoil is redder or siltier than normal. Also included were a few wet spots.

Cultivation is severely limited on this soil by the hazard of erosion. Crop rotation, contour strips with diversion terraces, and sodded waterways are needed for controlling erosion and conserving moisture. (Capability unit IVe–7; irrigation group 9; woodland group 16; drainage group not assigned)

Croom-Urban land complex, 0 to 8 percent slopes (CuB).—This complex consists of Croom soils and disturbed land that is mainly of Croom soil material. These areas are used for community developments. The soils have been rearranged into complex patterns. Although the individual soils can be recognized, mapping them separately is not practical. About 5 percent of each area mapped as this complex consists of undisturbed Croom soils and the rest consists of Croom soils that have been severely disturbed or altered by machines.

In about 60 percent of the acreage, the Croom soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. The surface layer of these areas has variable texture and may be gravelly loam or a mixture of gravel, sand, silt, and clay in any proportion.

About 35 percent of this unit consists of land fills, 18 inches or more in depth, or areas where most of the soil profile has been cut away. The surface layer is generally a mixture of sand, silt, and gravelly clay in various proportions. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Croom-Urban land complex, 8 to 15 percent slopes (CuC).—Except for steeper slopes, this complex is like Croom-Urban land complex, 0 to 8 percent slopes. Areas of this complex have been graded, terraced, and generally rearranged for community developments. Buildings, streets, and sidewalks cover from 10 to 40 percent of

each area. About 5 percent of each area mapped as this complex consists of Croom soils like the soil described for the Croom series; the rest consists of Croom soils that have been severely disturbed or altered by machines.

In about 60 percent of the acreage, the Croom soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. About 35 percent of the unit consists of land fills, 18 inches or more in depth, or places where the Croom soil profile has been cut away. The surface layer of these severely disturbed Croom soils has variable texture and is a mixture of sand, silt, and clayey gravel in various proportions. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Croom-Urban land complex, 15 to 35 percent slopes (CuE).—Except for steep slopes, this complex is like Croom-Urban land complex, 0 to 6 percent slopes. Areas of this complex have been graded, terraced, and generally rearranged for community developments. Buildings, streets, parking lots, and sidewalks cover from 10 to 40 percent of each area. Less than 5 percent of each area mapped as this complex consists of Croom soils like the soil described for the Croom series.

In about 50 percent of the acreage, the severely disturbed Croom soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. Nearly 45 percent of the unit consists of land fills, 18 inches or more in depth, or places where the Croom soil profile has been cut away. This cutting and filling is more evident in areas where small homesites have been established on the steeper slopes. In many places these areas consist of short, nearly level slopes above steep embankments. The surface layer of the severely disturbed Croom soils has variable texture and is a mixture of sand, silt, clay, and gravel in various proportions. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Donlonton Series

The Donlonton series consists of moderately well drained, nearly level to gently sloping soils on uplands, mainly in the central part of the county. These soils developed in old deposits of greenish clay that contained a considerable amount of greensand. Water moves slowly through the olive-brown subsoil, which is mottled in the lower part.

Profile of Donlonton fine sandy loam (in a wooded area on the Universitly of Maryland Tobacco Experimental Farm near Upper Marlboro):

A1—0 to 2 inches, very dark grayish-brown (2.5Y 3/2) fine sandy loam; moderate, fine, blocky structure; friable, slightly sticky and slightly plastic; many roots; strongly acid to very strongly acid; abrupt, smooth boundary. 2 to 3 inches thick.

A2—2 to 12 inches, dark grayish-brown (2.5Y 4/2) to olive-brown (2.5Y 4/4) fine sandy loam; weak, fine, granular structure; very friable, slightly sticky; many roots; strongly acid and very strongly acid; clear, smooth boundary. 8 to 18 inches thick.

B21t—12 to 20 inches, olive-brown (2.5Y 4/4) fine sandy clay loam; moderate, medium, blocky and subangular blocky structure; friable, sticky and plastic; many fine roots; thin, nearly continuous clay coatings; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

B22t—20 to 32 inches, olive-brown (2.5Y 4/4) heavy fine sandy clay; common, medium, prominent mottles of strong brown (7.5YR 5/6 and 5/8) and of greenish gray (5GY 5/1 and 6/1); strong, medium, blocky structure; friable to firm, sticky and plastic; few roots; distinct, nearly continuous clay coatings; common particles of glauconite; low bulk density; very strongly acid; abrupt, smooth boundary. 10 to 20 inches thick.

B23t—32 to 50 inches, olive-brown (2.5Y 4/4) sandy clay; common, medium and coarse, prominent mottles of strong brown (7.5YR 5/8) and greenish gray (5GY 6/1); weak to moderate, very coarse, blocky structure; firm, sticky and plastic; very few roots; discontinuous light olive-brown (2.5Y 5/4) clay coatings; common particles of glauconite; very strongly acid; abrupt, smooth boundary. 0 to 20 inches thick.

C—50 to 60 inches +, dark olive-green (5GY 3/2) fine sandy loam; massive; friable; many particles of glauconite; very strongly acid.

In Prince Georges County, the A horizon of Donlonton soils is dominantly fine sandy loam. The B horizon ranges from heavy sandy clay loam to heavy fine sandy clay or heavy clay loam and has an average content of clay of more than 35 percent. The C horizon is commonly stratified. It consists of layers that generally range from 1 to 3 feet in thickness and from loamy sand to clay in texture, but in places a layer of either texture may be 5 feet thick or more. The C horizon and the lower part of the B horizon vary greatly in bulk density, but these horizons generally are less dense than corresponding horizons in similar soils that were not derived from materials containing glauconite. Thin strata containing ferruginous sandstone (ironstone) or ferruginous concretions may occur in the solum, and thicker but discontinuous strata of these materials may occur in the C horizon. In some places mica flakes are in the profile, especially in the C horizon. The solum ranges from about 25 inches to more than 50 inches in thickness. Of the horizons in the solum, the B23t varies most in thickness.

The Ap horizon is dark grayish brown in most places. Matrix colors in the B horizon range from 7.5YR to 2.5Y in hue, and the value is 4 or 5. Chroma of the matrix ranges from 3 to 8 but is less than 6 in some part of the Bt horizon. The upper part of the profile generally is less olive and stronger brown than the lower part. The C horizon ranges from olive gray to a greenish color. Mottles in the B and C horizons are distinct or prominent and range from yellowish red to greenish gray.

The Donlonton soils are on the same kinds of material as the well-drained Monmouth soils and the poorly drained Colemantown soils. The Donlonton soils have a finer textured subsoil, are somewhat more greenish, and are more difficult to drain than the Adelphia soils, which are more sandy than the Donlonton soils throughout. The Donlonton soils are more olive or greenish than the Keyport soils, are less tough and compact, and are more permeable to water. Also, Keyport soils do not contain greensand.

The Donlonton soils are of limited extent and importance in Prince George County. They are used for general crops, and sometimes for tobacco where surface drainage is good. The native vegetation is mixed hardwoods that tolerate wetness.

Donlonton fine sandy loam, 0 to 2 percent slopes (DoA).—This is the soil described for the Donlonton series. Included in mapping were some small areas where the surface layer is either a little more silty or a little more sandy than the surface layer of the soil described.

This nearly level soil has slow runoff and is wet for considerable periods unless it is artificially drained. Drainage is the main problem of management. This soil is fairly easy to work when it is not wet and generally is not susceptible to erosion. (Capability unit IIw–9; drainage group 6–2B; irrigation group 8; and woodland group 11)

Donlonton fine sandy loam, 2 to 5 percent slopes, moderately eroded (DoB2).—This soil has better surface drainage than Donlonton fine sandy loam, 0 to 2 percent slopes, but it is more susceptible to erosion. Fine sand is dominant in the surface, or plow layer, but in a few places the plow layer contains a considerable amount of silty or sandy material. Included in mapping are some areas that are uneroded.

Erosion is the most important problem in managing this moderately wet soil. Surface drainage can be improved and erosion checked by planting crops in graded strips and using diversion terraces. Drainageways should be kept in sod. (Capability unit IIe–36; drainage group 6–2B; irrigation group 8; and woodland group 11)

Elkton Series

The Elkton series consists of poorly drained, nearly level to gently sloping soils on upland flats. These soils developed in beds of acid clay and silty clay of the Coastal Plain. They have a gray, highly clayey subsoil through which water moves very slowly.

Profile of Elkton silt loam (in a cultivated field near Bryan Point);

Ap—0 to 7 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; soft, friable, slightly sticky but nonplastic; roots plentiful; very strongly acid; abrupt, smooth boundary. 7 to 8 inches thick.

A2g—7 to 10 inches, light brownish-gray (2.5Y 6/2) silt loam; few, fine, distinct mottles of yellowish brown (10YR 5/8); weak, thin, platy structure (probably a plowsole); friable, slightly sticky but nonplastic; roots common; very strongly acid; clear, smooth boundary. 3 to 4 inches thick.

B1g—10 to 16 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, medium, distinct mottles of yellowish brown (10YR 5/8); moderate, fine, blocky structure; hard, friable to firm, sticky and slightly plastic; few roots; very strongly acid; gradual, smooth boundary. 5 to 6 inches thick.

B21tg—16 to 23 inches, light brownish-gray (2.5Y 6/2) silty clay; common, medium, distinct mottles of yellowish brown (10YR 5/8); strong, fine and medium, blocky structure; hard, firm, sticky and plastic; very few roots; distinct, continuous clay coatings; vertical seams of gray (5Y 5/1) clay; very strongly acid; gradual, smooth boundary. 6 to 10 inches thick.

B22tg—23 to 34 inches, gray or light-gray (5Y 6/1) clay; few, coarse, distinct mottles of yellowish brown (10YR 5/8); strong, fine and medium, blocky structure; very hard, very firm, sticky and plastic; distinct to prominent gray clay coatings; vertical seams of gray clay extending from horizon above; few fine roots along seams; very strongly acid and extremely acid; gradual, smooth boundary. 10 to 12 inches thick.

B23tg—34 to 47 inches, gray or light-gray (5Y 6/1) silty clay; common, medium and coarse, distinct mottles of reddish brown (5YR 4/4); strong, fine to coarse, blocky structure; hard, firm, sticky and plastic; distinct gray (5Y 5/1) coats and accumulations of clay; vertical seams of gray clay extending from horizons above; extremely acid; abrupt, smooth boundary. 12 to 15 inches thick.

B3b—47 to 96 inches +, yellowish-red (5YR 4/8) silty clay; few, medium, prominent mottles of olive gray (5Y 6/2); moderate, thick, platy and strong, coarse, blocky structure; hard, firm, sticky and plastic; prominent but discontinuous clay coats; small pockets and thin lenses of coarse sandy clay; extremely acid.

In Prince Georges County, the A horizon of Elkton soils is silt loam or fine sandy loam. In areas where the texture is fine sandy loam, the A horizon consists of nonconforming overwash material that is not genetically related to the B horizon. The B1 and B2 horizons are clay or silty clay, except in some places where they are of heavy silty clay loam in the lower part. The average content of clay in the B2t horizon is more than 35 percent. The B3b horizon is the remains of a paleosol, a soil buried by a later accumulation of fine sediment. This horizon is not present everywhere. Its place is frequently occupied by a massive, gray, silty clay C horizon, or a moderately sandy to very sandy IIC horizon, or both. The solum ranges from 30 to nearly 48 inches in thickness.

In undisturbed areas the Elkton soils have a thin, dark-gray or dark grayish-brown A1 horizon and a thicker A2 than the one described. In many places the A horizon, and, more particularly, the B1 and B21 horizons, are not brownish but are more distinctly gray and have a chroma of 1. The part of the B horizon above the B3b has a hue of 2.5Y to neutral, a value of 4 to 6, and a chroma of 2 or less. Mottling in the B horizon ranges from 10YR to 5YR in hue, from 4 to 5 in value, and from 4 to 8 in chroma.

The Elkton developed on the same kinds of material as the well drained Christiana soils and the moderately well drained Keyport soils. Elkton soils are similar to the Fallsington and Othello soils, but they are less sandy than the Fallsington soils and less silty than the Othello soils. Also, the Elkton soils are underlain by clay, whereas the Othello and Fallsington soils are underlain by sandy material.

The Elkton soils are of only moderate extent in Prince Georges County. If artificially drained, they are useful for many crops, but they are somewhat difficult to work and manage properly, even when drained. Wetness causes many difficult problems when these soils are used for residences or industrial buildings. The native vegetation is mixed hardwoods that tolerate wetness.

Elkton silt loam (Ek).—This soil is the one described for the Elkton series. It is nearly level to gently sloping. In most places the surface layer feels floury when it is dry, and it is somewhat sticky when wet. In some places this layer contains fine sand and feels slightly gritty. Included in mapping were some areas that have a gray, sticky clay surface layer and other areas where the surface layer is a mixture of dark olive-green sticky clay and fine sand.

Drainage is a major problem of management on this soil. Tile is not suitable for drainage, and ditches must be closely spaced. A few areas are in community developments. (Capability unit IIIw–9; drainage group 8–2B; woodland group 1; irrigation group 12)

Elkton fine sandy loam, thick surface, 0 to 5 percent slopes (ElB).—This soil occurs mainly on nearly level and gently sloping areas of the U.S. Department of Agriculture Research Center near Beltsville. The fine sandy loam surface layer is 15 to 30 inches thick over a gray sticky clay subsoil. Included in mapping were a few areas that have coarse sand in the surface layer.

This soil is suited to some crops that can be planted late and to hay and pasture plants. In most places undrained areas are used for grazing or as woodland. Drainage can be improved by digging ditches or by installing tile at the base of the sandy surface layer. Sloping areas can be farmed by using graded contour strips, diversion terraces, and sodded waterways. (Capability unit IIIw–11; drainage group 8–2C; woodland group 1; irrigation group 8)

Elsinboro Series

The Elsinboro series consists of deep, well-drained soils that developed in old alluvium along streams. Areas of these soils were once flood plains, but they are now

217-092—67——3

benchlike areas or terraces well above the normal flood stage because the streams have cut downward. The alluvium originally was washed from soils on the Piedmont and commonly contains a considerable amount of fine mica. The Elsinboro soils are nearly level to gently sloping in most places but are moderately sloping in a few places.

Profile of Elsinboro loam (in a level cultivated field in the Patuxent Research Center):

Ap—0 to 9 inches, brown or dark-brown (10YR 4/3) loam; weak, fine, granular structure; soft, very friable, nonsticky and nonplastic; roots plentiful; strongly acid; clear, smooth boundary. 8 to 10 inches thick.

B21t—9 to 28 inches, strong-brown (7.5YR 5/6) heavy loam or light clay loam; weak to moderate, medium and coarse, subangular blocky structure; slightly hard, friable, sticky and slightly plastic; roots fairly common; few, faint, brown (7.5YR 5/2) clay coatings; many fine mica flakes; very strongly acid; clear, wavy boundary. 16 to 24 inches thick.

B22t—28 to 35 inches, strong-brown (7.YR 5/6), somewhat gritty loam; weak, medium and coarse, blocky structure; slightly hard, very friable, slightly sticky and very slightly plastic; few roots; few, faint, discontinuous, brown or dark-brown (7.5YR 4/4) clay coats; very strongly acid; clear to abrupt, smooth boundary. 6 to 10 inches thick.

IIC—35 to 72 inches +, brown or dark-brown (7.5YR 4/4) gravelly sandy loam; massive; loose, nonsticky and nonplastic; few roots in upper part; waterworn gravel 15 to 25 percent by volume; abundant mica and feldspar; some dark minerals; very strongly acid.

In Prince Georges County, the A horizon of Elsinboro soils is loam or sandy loam. The B horizon is loam, silt loam, light clay loam, or light silty clay loam. The average content of clay in the B horizon ranges from 18 to 35 percent. In profiles that have an A horizon of sandy loam, the B horizon tends to be gritty and to contain more sand than the B horizon of the finer textured soil. In places the C horizon does not conform lithologically with the solum. In these places the C horizon is commonly coarser and more gravelly than the solum. The solum ranges from about 28 to more than 40 inches in thickness.

In wooded areas the Elsinboro soils have a thin, dark-brown A1 horizon and a somewhat thicker, yellowish-brown or brown A2 horizon. The hue of the B horizon is generally 7.5YR, but in places it is as yellow as 10YR or as red as 5YR. The value in the B horizon is 4 or 5, and the chroma is normally 6 or 8. The C horizon has about the same range in color as the B horizon but in many places has lower chroma.

In most places the Elsinboro soils have been slightly stratified where sediments have settled. They normally contain some waterworn gravel, which may be bedded in thin layers of either the solum or the substratum. The Elsinboro soils are also characterized by fine mica in the solum, and their substratum may be especially rich in mica.

The Elsinboro soils somewhat resemble the Sassafras soils, but the Sassafras soils have a more prominently expressed subsoil in most places and do not normally contain mica.

The Elsinboro soils are not extensive in this county. They occur only on old alluvial terraces in the northern and northwestern parts of the county where major streams have washed material from the Piedmont and mixed it with sedimentary material of the Coastal Plain. The Elsinboro are good soils for farming and are suited to nearly all crops. In most places, however, they occur in developed areas, particularly in Bladensburg, Hyattsville, Riverdale, and College Park, and on the broad terraces along the various branches of the Anacostia River. Smaller but important areas are near Bowie, in the Patuxent Research Refuge, and in the U. S. Department of Agriculture Research Center at Beltsville. The native vegetation is mixed upland hardwoods.

Elsinboro loam, 0 to 2 percent slopes (EmA).—This is the soil described for the Elsinboro series. Included in mapping were a few areas that are a little more silty than normal. This soil contains many silvery flakes of mica throughout.

This soil is on terraces and is well suited to most general crops and to deep-rooted crops. Under good management, it produces economic yields of corn, wheat, hay, and pasture. Yields of tobacco are satisfactory on this soil, but the quality may not be so good as that of tobacco produced on sandier soils. This soil holds a good supply of moisture available for plants, and it is not too difficult to work if it is not wet. Limitations for nonfarming uses are few. (Capability unit I–4; irrigation group 13; woodland group 7; drainage group not assigned)

Elsinboro loam, 2 to 5 percent slopes, moderately eroded (EmB2).—This soil is more eroded than Elsinboro loam, 0 to 2 percent slopes, and, in some places, is thinner or shallower to the underlying materials. Many silvery flakes of mica are throughout the profile. Included in mapping were a few spots that have shallow gullies and some areas where sticky subsoil material is in the surface layer. The erosion hazard is moderate.

This soil is well suited to most general crops and to deep-rooted crops. Under good management, it produces economic yields of corn, wheat, hay, and pasture. Yields of tobacco are satisfactory, but the quality may not be so good as that of tobacco produced on sandier soils. Protection from excessive erosion is provided if the rotations include hay crops and tillage is on the contour. Diversion ditches are needed in some places and waterways should be kept in sod. This soil has few limitations for nonfarming uses. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Elsinboro sandy loam, 0 to 2 percent slopes (EnA).—Except that medium and coarse sand are dominant in the surface layer, this soil is like Elsinboro loam, 0 to 2 percent slopes. Many silvery flakes of mica occur throughout the profile. Included in mapping were a few areas where fine, medium, and coarse pebbles are in the surface layer.

This soil is well suited to most general crops and to deep-rooted crops. It is not so high in moisture-holding capacity nor productive as Elsinboro loam, 0 to 2 percent slopes, but it is easier to work if the moisture content is favorable. Under good management it produces satisfactory yields of high-quality tobacco. Limitations for nonfarming uses are few. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Elsinboro sandy loam, 2 to 5 percent slopes, moderately eroded (EnB2).—This soil is typical of Elsinboro soils that occur in areas where the surface layer is sandy loam. Silvery flakes of mica occur throughout the profile. In many areas this soil is shallower to the underlying material than normal and in a few areas the surface layer contains some of the brown, sticky subsoil material. In a few spots a considerable amount of gravel is in the surface layer, and in some areas there are a few shallow gullies.

This soil is well suited to most general crops and to deep-rooted crops. If it is managed well, it produces satisfactory yields of truck crops, corn, small grain, hay, and pasture. The quality of the tobacco grown is high. Plants may be injured during long periods of drought, though the moisture-holding capacity is moderately high. Because there is a definite risk of erosion on this soil, some conservation measures are needed, including use of rotations and winter cover crops and farming in contour strips. Sodded waterways are also needed. Limitations for nonfarming uses are few. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Elsinboro sandy loam, 5 to 10 percent slopes, moderately eroded (EnC2).—This soil is typical of Elsinboro soils that occur in areas where the surface layer is sandy. In some places sticky subsoil material has been mixed into the surface layer. Included in mapping were some areas that have finer textured materials in their surface layer and some areas that are severely eroded. Also included were a few gravelly spots and a few areas that are in community developments.

This soil is suited to general crops and to deep-rooted crops. Tobacco of high quality can be produced under good management. Although the supply of moisture available to plants is good, this soil is somewhat droughty during long dry periods. Safe uses are limited by the serious hazard of erosion. Crop rotations, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Elsinboro-Urban land complex, 0 to 5 percent slopes (EuB).—This complex consists of Elsinboro soils and disturbed land that is mainly of Elsinboro soil material. These areas are used for community developments and have been modified by excavation and grading. The original soils have been rearranged into complex patterns on the landscape.

The Elsinboro soils are described under the Elsinboro series. About 20 percent of each area mapped as this complex consists of Elsinboro soils that are nearly level or gently sloping and have a surface layer that is only slightly graded or mixed. The surface layer of these slightly disturbed areas has variable texture and may be a mixture of sand, silt, and clay. More than 60 percent of each area mapped as this complex consists of places where as much as two-thirds of the Elsinboro soil has been removed or of places where land fills are as much as 18 inches deep. The surface layer of these severely disturbed areas is mostly sticky, sandy and clayey material that is similar to the subsoil of Elsinboro soils. Many silvery flakes of mica occur throughout the profile.

Nearly 20 percent of this complex has resulted from severe grading and land filling. Grading has cut away most of the original Elsinboro soil profile, or land filling has covered the soil to a depth of 18 inches or more. The surface layer has variable texture and may be sandy or a mixture of sand and clay containing some silvery flakes of mica.

In places a thin layer of dark brown, mainly medium-textured topsoil has been spread over the surface of this complex to provide a better seedbed for lawns. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Evesboro Series

The Evesboro series consists of very deep, sandy, somewhat excessively drained to excessively drained soils. These soils developed in sandy materials that probably were reworked by wind and possibly by water. The Evesboro soils are of a yellowish color and occur on nearly level to fairly steep uplands of the Coastal Plain.

The Evesboro soils are not mapped separately in Prince Georges County. They are mapped with the Galestown soils, as Galestown-Evesboro loamy sands; with Rumford soils, as Rumford-Evesboro loamy sands; and with Westphalia soils, as Westphalia-Evesboro complex.

Profile of Evesboro loamy sand (in an area of Virginia pine, along Good Luck Road):

A1—0 to 3 inches, dark-gray (10YR 4/1) loamy sand; very weak, medium, granular structure; loose, nonsticky and nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 2 to 3 inches thick.

C1—3 to 48 inches, yellowish-brown (10YR 5/4) loamy sand; single grain; loose; roots common in upper part, few in lower part; fine, smooth pebbles and some fragments of ferruginous sandstone (a thin Cirm horizon); very strongly acid to extremely acid; gradual, smooth boundary. 40 to 50 inches thick.

C2—48 to 72 inches +, very pale brown (10YR 7/4) sand; single grain; loose; few irregular and discontinuous streaks of brown or dark-brown (7.5YR 4/4) loamy sand or very light sandy loam; extremely acid.

In most places the plow layer of Evesboro soils is grayish brown (10YR 5/2) (fig. 6). The C1 horizon may be pale brown, light yellowish brown, or brownish yellow. This horizon may be exposed in areas where soil has been lost or shifted through wind or water erosion or through grading.

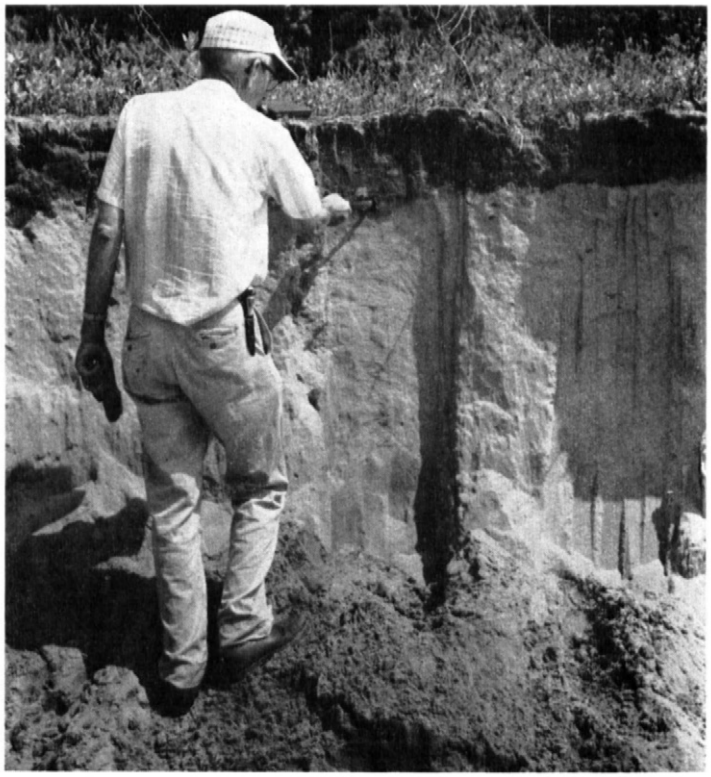

Figure 6.—**Profile of the Evesboro loamy sand. A soil scientist points to the lower boundary of the plow layer, Ap, which had been moistened by a light shower, and to the top of the C1 horizon. The lighter colored, sandier C2 horizon begins approximately at the level of his right knee.**

The Evesboro soils are loamy sand throughout, or their C2 horizon is sand. Some areas, particularly those in the southern part of the county, are gravelly. The pebbles are smooth and generally rounded pieces of quartz or chert, most of them less than one-half inch in diameter. The content of gravel commonly increases with depth.

In most places the plow layer is grayish brown. The C1 horizon may be light olive brown, light yellowish brown, or pale brown. The C2 horizon is generally paler than the C1. Except in the A1 horizon and in the Ap horizon in some places, hue ranges from 10YR to 2.5Y, value ranges from 5 to 7, and chroma is generally 3 or 4 but is as much as 6 in some small parts of the C horizon. Within a depth of 40 inches, there are no gray colors, or colors having a chroma of 2 or less.

The Evesboro soils are on the same kinds of material as the Galestown soils, which are of a stronger and brighter brown. Also developed on the same kinds of material as the Evesboro soils are the moderately well drained Klej, the poorly drained Plummer, and the very poorly drained Rutlege soils.

The Evesboro soils are very low in fertility and tend to be droughty. Many areas, however, are suitable for tobacco and other crops if management is good. Excess water is not a problem in residential areas, but special care is needed in establishing and maintaining lawns and ornamental plants. The native vegetation consists of scrub hardwoods and a considerable number of Virginia pines.

Fallsington Series

The Fallsington series consists of poorly drained soils that have a gray subsoil through which water moves readily. These soils are on the Coastal Plains, where they developed on old sandy deposits containing moderate amounts of silt and clay. They occur on uplands, chiefly in nearly level areas. Some areas are gently sloping to moderately sloping.

Profile of Fallsington sandy loam (in an idle field between Upper Marlboro and Croom):

Ap—0 to 8 inches, dark grayish-brown (2.5Y 4/2) sandy loam; weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful; very strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

A2g—8 to 12 inches, gray or light-gray (5Y 6/1) sandy loam; few, fine, distinct mottles of light olive brown (2.5Y 5/4); weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots fairly common; very strongly acid; abrupt, smooth boundary. 4 to 5 inches thick.

B2tg—12 to 27 inches, gray or light-gray (5Y 6/1) light sandy clay loam; common, medium, prominent mottles of strong brown (7.5YR 5/8) and yellowish red (5YR 4/8); weak, thick, platy and weak, medium, blocky structure; hard, friable, sticky and slightly plastic; few roots; discontinuous coats of clay or silt; very strongly acid and extremely acid; clear, smooth boundary. 12 to 18 inches thick.

C1g—27 to 34 inches, gray or light-gray (5Y 6/1) fine sandy loam; massive; soft, friable, nonsticky and nonplastic; very few roots; extremely acid; abrupt, smooth boundary. 6 to 8 inches thick.

IIC2irm—34 to 38 inches, dark reddish-brown (5YR 3/4) sand, indurated by illuvial iron; extremely hard; abrupt, pitted boundary. 3 to 4 inches thick.

IIC3—38 to 48 inches +, very pale brown (10YR 7/3) somewhat gravelly sand; loose; extremely acid.

The solum ranges from about 24 to 36 inches in thickness; an average thickness is about 28 inches. In undisturbed areas the A1 horizon is dark gray or dark grayish brown and is about 3 to 5 inches thick. The A2g horizon is somewhat thicker than the horizon described and, in most places, is gray without significant mottling. The B2tg horizon is generally sandy clay loam, but in some places, particularly where the A horizon is very light sandy loam, it is heavy sandy loam. The C horizon may be of almost any texture or kind of material. In places a nonconforming C horizon occurs within a depth of 5 feet. In some places the IIC2irm horizon is very thin or is fragmented and discontinuous, and two IIC2irm horizons may occur in the profile. A IIC2irm horizon is not present in all areas of Fallsington soils in Prince Georges County. In some areas the C1g horizon is strongly mottled with strong brown (7.5YR 5/6 or 5/8).

The Fallsington soils are on the same kinds of material as the well drained Sassafras and the moderately well drained Woodstown soils. The Fallsington are similar in some respects to the Elkton and Othello soils but do not have a heavy clayey subsoil like that in the Elkton soils or a highly silty surface layer and subsoil like those in the Othello soils.

The Fallsington soils are not extensive. They are mainly in the south-central part of the county in an area around the Andrews Air Force Base. If drained, these soils are suited to most common crops. Poor drainage is a special problem if they are used as residential areas. The native vegetation is hardwoods that tolerate wetness.

Fallsington sandy loam (Fs).—Most of this soil is level or nearly so, but a few areas are more sloping. Included in mapping were some spots that are severely eroded and a few areas where shallow gullies have formed. Also included were a few very sandy spots.

Wetness is the most important problem of management. If adequately drained, however, this soil is suited to corn, soybeans, and some hay and pasture plants. This soil has severe limitations for most nonfarm uses. (Capability unit IIIw–6; drainage group 7–B; irrigation group 9; and woodland group 1)

Fallsington loam (Fl).—This nearly level soil is typical of Fallsington soils that occur in areas where the surface layer is loam. Included in mapping were some areas where the slopes are more than 2 percent. Also included were small slightly eroded areas.

Wetness is the most important problem of management on this soil. Except where there is much sand in the surface layer, this soil is difficult to drain or to work. Either ditches or tile is suitable for drainage. If this soil is adequately drained, it is suited to corn, soybeans, and some hay and pasture plants. Erosion is not a problem on this soil, and row crops can be grown for several successive years, if cover crops are used and the land allowed to lay fallow every few years.

This soil has severe limitations for most nonfarm uses. (Capability unit IIIw–7; drainage group 7–A; irrigation group 13; and woodland group 1)

Fallsington-Urban land complex (Fu).—This complex consists of Fallsington soils and disturbed land that is mainly Fallsington soil material. These areas are used for community developments. They are mostly nearly level, but a few places are gently sloping.

About 20 percent of each area mapped as this soil consists of soils like the soil described for the Fallsington series and about 40 percent consists of Fallsington soils that have been covered with soil materials to a depth of 6 to 18 inches. These soil materials consist of sand, silt, or clay in various proportions. The rest of this complex is Fallsington soils that have been covered to a depth of 18 inches or more. The surface layer consists of sand, silt, and clay in varying proportions.

Areas of this complex have been filled for the construction of streets, buildings, parking lots, and playgrounds. (Drainage group 7–B; capability unit, irrigation group, and woodland group not assigned)

Galestown Series

The Galestown series consists of very deep, very sandy, somewhat excessively drained to excessively drained soils that developed in very sandy materials. These soils probably have been reworked by wind and by water. They have a highly colored, normally strong-brown subsoil. These level to steep soils commonly are near but well above streams and drainageways.

Profile of Galestown loamy sand (in an area of Virginia pine, near the end of Mill Branch Road):

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, granular structure; loose, nonplastic and nonsticky; roots abundant; very strongly acid; abrupt, smooth boundary. 2 to 3 inches thick.

A2—2 to 8 inches, dark yellowish-brown (10YR 3/4) loamy sand; weak, fine, granular structure; loose, nonplastic and nonsticky; roots common; very strongly acid; clear, smooth boundary. 6 to 9 inches thick.

B2t—8 to 33 inches, strong-brown (7.5YR 5/6) loamy sand; weak, medium, granular to very weak, fine, blocky structure; very friable, nonplastic but slightly sticky; roots fairly common; sand grains coated with and partly bridged by clay; content of clay significantly greater than that in A and C horizons; very strongly acid; clear, smooth boundary. 22 to 28 inches thick.

IIB3—33 to 43 inches, brown or dark-brown (7.5YR 4/4) gravelly loamy sand; weak, fine, granular structure; loose, nonplastic and nonsticky; very few roots; fine smooth gravel about 20 percent by volume; sand and gravel are very weakly and irregularly coated with clay; very strongly acid; clear, irregular to broken boundary. 0 to 12 inches thick.

IIIC—43 to 120 inches +, yellowish-brown (10YR 5/4) stratified sandy fine gravel; very strongly acid and extremely acid.

In Prince Georges County, most of the Galestown soils have developed in three kinds of contrasting materials, as in the profile described. The three kinds are (1) loamy sand or sand, in which the A1, A2, and B2 horizons have developed; (2) gravelly loamy sand, in which the IIB3 horizon has developed; and (3) stratified gravel, which is the IIIC horizon. In places the solum, or A and B horizons, and the C horizon to a depth of 5 feet or more, have developed in the first kind of contrasting materials. In other places the entire profile has developed in materials of the second kind. In most places the IIB3 horizon is lacking or is discontinuous; it may or many not be gravelly, and may be part of the first or second kind of contrasting materials.

The plow layer is dark grayish brown (10YR 4/2) in most places but is less gray and more distinctly brown in eroded areas. The B2 horizon has a hue that grades toward 10YR and 5YR. The value of the B2 horizon ranges from 4 to 6, and chroma ranges from 6 to 8. The C horizon is yellower and paler than the B horizon. Galestown soils do not show any evidence of wetness.

The Galestown soils developed on the same kinds of sandy material as the Evesboro soils, the moderately well drained Klej, the poorly drained Plummer, and the very poorly drained Rutlege soils. Galestown soils are not so yellow as the Evesboro soils, which are dunelike in places.

The Galestown soils are not extensive in this county. Most areas are adjacent to the larger streams and rivers. These soils are suited to most crops, but they tend to be droughty. Crops on them benefit greatly from irrigation. Special fertility and management practices may be needed in residential areas to establish and maintain lawns and ornamental plants of high quality. The native vegetation consists of scrub hardwoods in stands that Virginia pine has strongly invaded.

Galestown loamy sand, 0 to 8 percent slopes (GdB).—This is the soil described for the Galestown series. The underlying material is practically free of gravel in some places and contains varying amounts of gravel in others. Included in mapping were a few areas that have greensand, or glauconitic material, in the profile.

This coarse, loose, and droughty soil is severely limited for farming. It is suited to deep-rooted crops, but irrigation is required if shallow-rooted crops are grown. The surface needs to be protected by plants at all times so as to prevent washing and blowing. (Capability unit IVs–1; irrigation group 1; woodland group 5; drainage group not assigned)

Galestown loamy sand, 8 to 15 percent slopes (GdC).—Except that it is somewhat steeper, this soil is like Galestown loamy sand, 0 to 8 percent slopes. Included in mapping were small areas that have some silvery mica flakes or greensand in the profile. Also included were areas where shallow gullies have formed.

This soil is not well suited to cultivation. It is suited to trees, to limited grazing, or as wildlife habitats. (Capability unit VIIs–1; woodland group 5; irrigation group and drainage group not assigned)

Galestown gravelly loamy sand, 0 to 8 percent slopes (GaB).—This soil is typical of Galestown soils that occur in areas where 15 to 20 percent or more of the soil mass is fine, smooth, rounded pieces of gravel. In most places the underlying material is extremely gravelly. Included in mapping were a few places where shallow gullies have formed.

This soil is coarse, loose, droughty, and severely limited for farming. It is suited to deep-rooted crops, but irrigation is required if shallow-rooted crops are grown. The surface needs to be protected by plants at all times so as to prevent both washing and blowing. (Capability unit IVs–1; irrigation group 1; woodland group 5; drainage group not assigned)

Galestown gravelly loamy sand, 8 to 15 percent slopes (GaC).—Except that it is somewhat steeper, this soil is like Galestown gravelly loamy sand, 0 to 8 percent slopes. Included in mapping were places where gullies have formed. Some of the gullies are fairly deep.

This soil is not well suited to cultivation. It is better suited to trees, to limited grazing, or as wildlife habitats. Many areas of this soil provide a source of gravel. (Capability unit VIIs–1; woodland group 5; irrigation group and drainage group not assigned)

Galestown-Evesboro loamy sands, 0 to 8 percent slopes (GeB).—This complex consists of areas of Galestown soils and Evesboro soils that are so intricately intermingled that it is not practical to separate the soils on a map of the scale used. Each soil is like the one described for its respective series. Included in mapping were a few spots that are gravelly and areas where a few shallow gullies have formed.

These coarse, loose, droughty soils are severely limited for farming. The surface should be protected by plants at all times so as to prevent washing and blowing. (Capability unit IVs–1; irrigation group 1; woodland group 5; drainage group not assigned)

Galestown-Evesboro loamy sands, 8 to 15 percent slopes (GeC).—Except for steeper slopes, this complex is like

Galestown-Evesboro loamy sands, 0 to 8 percent slopes. Included in mapping were some spots that are gravelly and a few areas where gullies have formed.

The soils are not suitable for cultivation. They are suited to trees, to limited grazing, or as wildlife habitats. (Capability unit VIIs–1; woodland group 5; irrigation group and drainage group not assigned)

Galestown-Urban land complex, 0 to 8 percent slopes (GmB).—This complex consists of Galestown soils that have been modified by excavation or grading for community developments and of disturbed land that is mainly of Galestown soil material. The original Galestown soils have been rearranged into complex patterns on the landscape.

Nearly 30 percent of each area mapped as this complex is like the soil described for the Galestown series. More than 50 percent consists of Galestown soils that have had as much as two-thirds of their profile removed or that are covered with as much as 18 inches of soil material. In most places the surface layer is mixed sand and gravel. About 20 percent of the complex consists of land fills, 18 inches or more thick, or places where the Galestown soil has been cut away. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Galestown-Urban land complex, 8 to 15 percent slopes (GmC).—Except for steeper slopes and a higher proportion of disturbed land, this complex is like Galestown-Urban land complex, 0 to 8 percent slopes.

About 15 percent of each area mapped as this complex is like the soil described for the Galestown series. About 60 percent consists of severely disturbed Galestown soils that are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. Nearly 25 percent consists of land fills, 18 inches or more in depth, or places where the Galestown soil profile has been cut away. Both the cuts and fills have a surface layer that is sandy in most places and gravelly in some places. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Glenelg Series

The Glenelg series consists of deep, moderately thick, well-drained soils that are nearly level to strongly sloping. These soils occur on uplands of the Piedmont in a narrow, irregular strip along the Montgomery County line. They developed in place from weathered mica schist, gneiss, and other related rocks, instead of from sediments that cover most of the county. This material contains a fairly large amount of mica.

Profile of Glenelg loam (in a wooded area about 3 miles west of Laurel):

A1—0 to 1 inch, dark-brown (10YR 3/3) loam; weak, fine, granular structure; soft, loose, nonsticky and nonplastic; roots abundant; extremely acid; abrupt, smooth boundary. 1 to 2 inches thick.

A2—1 to 8 inches, dark yellowish-brown (10YR 4/4) loam; weak, coarse, granular to very weak, fine, subangular blocky structure; soft, very friable, slightly sticky but nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 6 to 8 inches thick.

B21t—8 to 17 inches, brown or dark-brown (7.5YR 4/4) loam; weak, medium, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; roots common; thin, discontinuous clay coatings; very strongly acid; clear, smooth boundary. 7 to 10 inches thick.

B22t—17 to 30 inches, strong-brown (7.5YR 5/6) light silty clay loam; moderate, medium, subangular blocky structure; hard, friable to firm, sticky and slightly plastic; roots common in upper part, few in lower part; thin, distinct, dark-brown (7.5YR 3/4) clay coatings, fine mica flakes plentiful; very strongly acid; clear, wavy boundary. 12 to 18 inches thick.

C—30 to 120 inches, variegated strong-brown (7.5YR 5/8) and yellow (10YR 7/6), highly micaceous, loamy saprolite; inherent schistose structure; loose to very friable, very slightly sticky but nonplastic; few roots in upper part; very strongly acid; abrupt, irregular boundary. 60 to 140 inches thick.

R—120 inches +, moderately hard mica schist.

In Prince Georges County, the A horizon of Glenelg soils is loam, but it contains almost enough fine material to be silt loam. The content of clay in the B horizon ranges from 18 to 35 percent. The C horizon ranges from loam to sandy loam. The solum ranges from 18 to 34 inches in thickness.

In cultivated areas the plow layer is normally brown. The hue throughout the Glenelg soils is generally 10YR or 7.5YR, but in places it grades toward 5YR. The B horizon has a value of 4 or 5. Its chroma ranges from 6 to 8 in a part of the horizon but is less than 6 in another part. The C horizon is variegated in most places but is not gray and does not show other evidence of wetness. The solum and C horizon of Glenelg soils contain a large amount of fine mica.

The Glenelg soils developed from the same kinds of weathered rock as the Manor soils but are not so red nor so deep to bedrock. The subsoil of Glenelg soils is finer textured than the surface layer, but the Manor soils have uniform texture throughout.

The Glenelg soils are of minor extent in the county. Although they are good soils for farming, they are mainly in community developments. The hazard of erosion on the stronger slopes is the only serious limitation on use for these developments. The native vegetation is mixed upland hardwoods, mainly oak.

Glenelg loam, 8 to 15 percent slopes, moderately eroded (GnC2).—This soil is the one described for the Glenelg series. It occurs in rather small areas in the Chillum community and west of Laurel. Included in mapping were a few spots that have somewhat impeded internal drainage.

This soil is well suited to general crops and to deep-rooted crops, but use is limited by the hazard of erosion. The use of rotations on contoured strips, diversion terraces, and sod waterways help to control erosion. This soil has few limitations for most nonfarm uses. (Capability unit IIIe–4; irrigation group 13; woodland group 30; drainage group not assigned)

Glenelg-Urban land complex, 0 to 8 percent slopes (GoB).—This complex consists of Glenelg soils and disturbed land that is mainly of Glenelg soil material. These areas are used for community developments. About 10 percent of each area mapped consists of Glenelg soil described as representative of the Glenelg series. About 50 percent consists of Glenelg soils that has been severely disturbed or altered by man.

These disturbed soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. In the severely disturbed areas, the surface layer is loam or a mixture

of sand, silt, and clay in almost any proportion. In many places mica flakes are common in the surface layer.

About 40 percent of this unit consists of land fills, 18 or more inches thick, or places where most of the Glenelg soil profile has been cut away. The surface layer may be of almost any texture. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Gravel and Borrow Pits

This miscellaneous land type consists chiefly of areas where soil material has been removed for use in highway construction or for other purposes and of larger areas that have been stripped for mining gravel or sand.

Gravel and borrow pits (Gp).—Gravel and borrow pits account for 2,790 acres in the county, and as construction continues, more areas are likely to be created. Although these areas are no longer suited to farming or other normal purposes, some of them can be planted to grass or to shrubs and trees. For most purposes, these areas require intensive or drastic reclamation that includes filling and grading and, in some places, establishing drainage outlets. Some pits could be filled with refuse and covered with clean soil material; other pits could be converted into ponds. After these improvements have been made, many areas of this unit might be suitable as a wildlife habitat, as a recreation area, or as commercial or industrial sites. (Capability unit VIIIs–4; woodland group, irrigation group, and drainage group not assigned)

Hatboro Series

The Hatboro series consists of nearly level or gently sloping, poorly drained soils on flood plains of streams. These soils are mainly in the northwestern part of the county on the Piedmont, but they extend into the Coastal Plain along the rivers and major streams. The recent sediments making up these soils washed from areas of acid crystalline rocks and contain a considerable amount of finely divided mica.

Profile of Hatboro silt loam (on the wooded flood plain of the Patuxent River, in the Patuxent Research Refuge):

A11—0 to 2 inches, brown or dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; soft, friable, slightly sticky and slightly plastic; roots abundant; strongly acid; abrupt, smooth boundary. 2 to 3 inches thick.

A12—2 to 6 inches, brown or dark-brown (10YR 4/3) silt loam; few, distinct, fine mottles of dark brown (7.5YR 3/2); moderate, coarse, granular structure; soft, friable, slightly sticky and slightly plastic; roots plentiful; strongly acid; gradual, smooth boundary. 3 to 6 inches thick.

A13—6 to 13 inches, brown (10YR 5/3) light silty clay loam; common, medium, faint mottles of brown (7.5YR 5/2); weak, coarse, granular structure; hard, friable, plastic and slightly sticky; few roots; many mica flakes; strongly acid; abrupt, smooth boundary. 7 to 10 inches thick.

B2g—13 to 36 inches, gray or light-gray (5Y 6/1) loam; common, medium and coarse, prominent mottles of yellowish brown (10YR 5/8); weakly stratified; soft, friable, slightly sticky and slightly plastic; very few roots; old root channels filled with brown silt; highly micaceous; strongly acid; gradual, smooth boundary. 18 to 24 inches thick.

Cg—36 to 48 inches, gray or light-gray (5Y 6/1) fine sandy loam; common, coarse, prominent mottles of yellowish brown (10YR 5/8); single grain; soft, loose to very friable, nonsticky and nonplastic; highly micaceous; medium acid.

In some areas the surface is covered by a thin overwash of silt loam to fine sandy loam. The A horizon is not so thick in all places as it is in the soil described for the series, and in some places it is somewhat mottled with gray in the lower part. The C horizon has an olive to slightly bluish or greenish color in some places and tends to have platy or blocky structure in the upper part. The water table is seasonally at or near the surface and is seldom much below a depth of 30 inches, even in drained areas. The clay content of the B and C horizons averages more than 18 percent.

The Hatboro soils are on the same general kinds of material as the well drained Comus soils and the moderately well drained Codorus soils. In many respects they are similar to the Bibb soils on the Coastal Plain, but Bibb soils are on materials that washed from old sediments and contain little mica.

The Hatboro soils are fairly extensive in Prince Georges County. They are mainly on the flood plains of Indian Creek, Paint Branch, Northwest Branch, and Sligo Branch in the northwestern part of the county, and on the flood plain of the Patuxent River above a point a short distance upstream from Arundel. If drained and protected from flooding, these soils are useful for farming. Because these soils occur mostly in residential areas, practical uses are wildlife habitats, parks, and recreational areas. Wooded areas normally have an excellent stand of wetland hardwoods.

Hatboro silt loam (Ha).—This is the soil described for the Hatboro series. Most areas are nearly level. Included in mapping were some areas that are covered by a thin layer of somewhat sandy overwash.

This poorly drained soil is subject to flooding and is wet for long periods. Either ditches or tile can be used for draining this soil if outlets are adequate. This soil is not susceptible to erosion and can be kept in row crops for several years if cover crops are used and the land is allowed to lay fallow every few years. Areas subject to frequent flooding are limited mainly to use for grazing, woodland, wildlife, or recreation. A few areas are used for parking lots, buildings, and other community facilities. (Capability unit IIIw–7; drainage group 11–A; irrigation group 10; and woodland group 22)

Howell Series

The Howell series consists of deep, well-drained soils that developed in thick beds of silty material. In this material are a considerable amount of clay, some fine and very fine sand, and, in places, traces of greensand. The Howell soils occur on nearly level to steep uplands, mainly in the central part of the county.

Profile of Howell fine sandy loam (in a reforested area south of Upper Marlboro):

Ap1—0 to 1 inch, dark grayish-brown (2.5Y 4/2) fine sandy loam; very weak, fine, granular structure; hard, friable, nonsticky and nonplastic; roots plentiful; very strongly acid; abrupt, smooth boundary. 1 inch to 2 inches thick.

Ap2—1 to 10 inches, brown (10YR 5/3) fine sandy loam; very weak, fine, granular structure; hard, friable, nonsticky and nonplastic; roots fairly plentiful; very strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

B21t—10 to 20 inches, strong-brown (7.5YR 5/8) silty clay; strong, fine, blocky structure; very hard, friable to firm, sticky and plastic; roots common; old root channels

filled with brown (10YR 5/3) fine sandy silt; distinct, discontinuous, strong-brown (7.5YR 5/6) clay coatings; very strongly acid and extremely acid; gradual, irregular boundary. 8 to 14 inches thick.

B22t—20 to 30 inches, strong-brown (7.5YR 5/8) fine silty clay loam; compound structure: moderate, medium, platy and moderate, fine, blocky; hard, friable, plastic and slightly sticky; very few roots; old channels filled with brown (10YR 5/3) fine sandy silt; prominent yellowish-red (5YR 5/8) coats on horizontal faces and prominent strong-brown (7.5YR 5/6) clay coats on vertical faces; few small pockets or lenses of gray or light-gray (5Y 6/1) very fine sandy silt resembling material of the C horizon; very strongly acid and extremely acid; gradual, irregular boundary. 6 to 16 inches thick.

B3—30 to 42 inches, variegated strong-brown (7.5YR 5/8) and yellowish-brown (10YR 5/6) fine silty clay loam; compound structure; moderate, medium, platy and moderate, fine, blocky; hard, friable, very slightly sticky and moderately plastic; distinct but discontinuous, strong-brown (7.5YR 5/6) clay coatings; many irregular pockets or lenses of gray or light-gray (5Y 6/1) very fine sandy silt resembling material of the C horizon; very strongly acid and extremely acid; clear, irregular boundary. 10 to 20 inches thick.

C—42 to 60 inches +, variable gray or light-gray (5Y 6/1) to very pale brown (10YR 7/3) very fine sandy silt; massive to very weak, very coarse, blocky structure in upper part; very slightly hard, very friable, nonsticky and nonplastic; feels floury when dry; material in horizon consists of silt, diatomaceous earth, very fine quartz sand, and distinct particles of glauconite the size of fine sand; glauconite makes up less than 5 percent of horizon, by volume; horizon generally becomes grayer and less brown with increasing depth; very strongly acid and extremely acid.

In Prince Georges County, the original A horizon of Howell soils is loam, silt loam, or fine sandy loam. In most severely eroded areas, however, the plow layer is clay loam. The B horizon is generally silty clay, but in places it is heavy clay loam or heavy silty clay loam. The C horizon is stratified and ranges from silt to clay in texture. The solum ranges from about 30 inches to nearly 60 inches in thickness.

In most places the plow layer is brown, but in severely eroded areas it may be strong brown. In some areas the B horizon is slightly redder than the one described and has a hue approaching 5YR. In some places the C horizon is absent or is much thinner than the one described. In these places the C horizon is underlain, or has been replaced, by a IIC horizon that contains a small amount of diatomaceous earth and a larger amount of glauconite. The gray color in the B3 and C horizons is inherent and does not indicate impeded drainage.

The Howell soils are on the same kinds of material as the well-drained Marr and the Westphalia soils. The Howell soils are more silty and have a more strongly developed subsoil than the Marr soils. They contain less sand than the Westphalia soils, which have a weakly developed subsoil. The Howell soils have a browner, finer textured subsoil than the Collington and the Monmouth soils, but they are not so red nor so fine textured as the Christiana soils. The Howell soils have brighter colors and are more acid than the Matapeake soils.

The Howell soils are of limited extent in the county but are important for farming. Some are in an area of community development. The native vegetation is mixed hardwoods.

Howell fine sandy loam, 2 to 6 percent slopes, moderately eroded (HoB2).—This soil is like the one described for the Howell series. The risk of erosion is moderate. Included in mapping were some areas that are uneroded or slightly eroded, and a few spots where some of the sticky subsoil has been turned up and mixed with the original surface soil.

If this soil is farmed, conservation practices are needed to control erosion. Among these practices are contour stripcropping and adequate rotations, diversion terraces, and sod waterways. (Capability unit IIe–28; irrigation group 5; woodland group 7; drainage group not assigned)

Howell fine sandy loam, 6 to 12 percent slopes, moderately eroded (HoC2).—This soil is steeper than the soil described for Howell series and is more susceptible to erosion. It is suited to general crops and to deep-rooted crops, but use is limited by slope and erosion. Good practices are contour stripcropping in narrow strips and suitable long rotations. Diversion terraces may be needed, and waterways should be kept in a full sod. (Capability unit IIIe–28; irrigation group 5; woodland group 8; drainage group not assigned)

Howell silt loam, 0 to 6 percent slopes, moderately eroded (HwB2).—This soil is typical of Howell soils that occur in areas where the surface layer is highly silty. Included in mapping were some areas that are nearly level and uneroded or slightly eroded and a few areas that are severely eroded.

This soil is suited to general crops and to deep-rooted crops. Because the fine-textured subsoil does not absorb water readily, runoff is rapid. Much of this runoff can be intercepted by diversion terraces that are rather closely spaced. Sod is needed to protect the waterways. Crops can be grown in the contour strips between the diversion terraces. (Capability unit IIe–29; irrigation group 12; woodland group 7; drainage group not assigned)

Howell silt loam, 6 to 12 percent slopes, moderately eroded (HwC2).—This soil is steeper than Howell silt loam, 0 to 6 percent, moderately eroded, and more susceptible to erosion. Included in mapping were a few gravelly spots, and places where a few shallow gullies have formed. Although this soil is good for farming and many other uses, intensive conservation measures are needed for safe and continued use. (Capability unit IIIe–29; irrigation group 12; woodland group 8; drainage group not assigned)

Howell clay loam, 6 to 12 percent slopes, severely eroded (HcC3).—This severely eroded soil has a clayey surface layer that normally is in poor tilth. This layer is compact, firm, and very hard when dry and is sticky and easily puddled when wet. Included in mapping were areas where the surface layer contains a considerable amount of fine sand. Gullies, some of them deep, occur in places.

This soil can be worked only in a narrow range of moisture content. It is susceptible to erosion and requires intense conservation measures if it is to be used safely for farming. It is suitable for cultivated crops about 1 year in 5, if sod, or other highly protective plants, are used the rest of the time. (Capability unit IVe–3; irrigation group 14; woodland group 17; drainage group not assigned)

Howell clay loam, 12 to 20 percent slopes, severely eroded (HcD3).—Except for steeper slopes, this soil is like Howell clay loam, 6 to 12 percent slopes, severely eroded. Some areas are gullied. The hazard of erosion prevents cultivation. This soil may be used for hay or pasture, but special care is needed to prevent overgrazing. (Capability unit VIe–2; woodland group 17; irrigation group and drainage group not assigned)

Howell silt loam, 12 to 20 percent slopes, moderately eroded (HwD2).—Except that it is strongly sloping to

steep, this soil is like Howell silt loam, 0 to 6 percent slopes, moderately eroded. Some areas are uneroded and some are slightly eroded. Included in mapping were some spots where the surface layer is somewhat less silty and more sandy than that in the soil described for the Howell series.

Because this soil is steep and its subsoil absorbs water slowly, runoff tends to be very rapid, and erosion is a hazard. Economically this soil is only marginal for most crops except hay and pasture, though some crops may be grown infrequently in a long rotation. (Capability unit IVe–3; irrigation group 12; woodland group 8; drainage group not assigned)

Howell silt loam, 20 to 35 percent slopes, moderately eroded (HwE2).—This soil is on steep hillsides. In some wooded areas little soil has been lost by erosion, but most areas have lost a significant part of the original surface layer. Included in mapping were a few areas steeper than 35 percent and some spots where the surface soil is somewhat more sandy than normal.

Because this steep soil cannot absorb water fast enough to prevent rapid runoff, the hazard of erosion is extremely high. Pasture and, in some places, hay are suited, but generally a better use is trees or wildlife habitats. (Capability unit VIe–2; woodland group 9; irrigation group and drainage group not assigned)

Hyde Series

The Hyde series consists of very poorly drained soils in depressions on the Coastal Plain. These soils are very dark colored and are rich in organic matter. They developed on local deposits of fine clayey materials, and their surface layer has been built up by the accumulation of decaying plants.

Profile of Hyde silt loam (in an idle field near Glenn Dale):

Apg—0 to 7 inches, very dark brown (10YR 2/2) silt loam, high in organic-matter content; few, fine, prominent mottles of yellowish red (5YR 4/8); weak, fine, granular structure; soft, friable, nonsticky but slightly plastic; abundant fine roots; extremely acid; abrupt, smooth boundary. 7 to 8 inches thick.

A12g—7 to 13 inches, black (10YR 2/1) silt loam, very high in organic-matter content; few, medium, prominent mottles of yellowish red (5YR 5/8); weak, fine, granular structure; hard, friable, nonsticky but plastic; roots common; extremely acid; gradual, smooth boundary. 6 to 8 inches thick.

A13g—13 to 24 inches, black (10YR 2/1) loam, high in organic-matter content; very weak, fine, blocky structure; hard, friable, plastic and slightly sticky; few roots; extremely acid; clear, smooth boundary. 8 to 12 inches thick.

A14g—24 to 32 inches, black (10YR 2/1) light silty clay loam, high in organic-matter content; weak, fine, blocky structure; hard, firm, sticky and plastic; few roots; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

B2tg—32 to 44 inches, light brownish-gray (2.5Y 6/2) silty clay; common, medium, distinct mottles of dark yellowish brown (10YR 4/4); massive; hard, firm, plastic and sticky; very strongly acid; abrupt, smooth boundary. 10 to 12 inches thick.

IICg—44 to 60 inches +, light brownish-gray (2.5Y 6/2) fine sand; common, medium, distinct mottles of yellowish brown (10YR 5/8); single grain; loose, nonplastic and nonsticky; very strongly acid and extremely acid.

The A horizon, which is 32 inches thick in the profile described, appears to be an accumulation of the residue from decayed vegetation and probably some deposits of silt and fine sand.

217-092—67——4

The mottling in the Apg and A12g horizons is probably the result of incomplete mixing of the decomposed organic matter with the matrix of the soil. Mottling is notably absent from the A13g and A14g horizons. The dark brown color of the Apg horizon is probably caused by incomplete decomposition of recent accumulations of organic matter and incomplete coating of mineral grains. The Hyde soils are not subject to flooding by streams, but they occupy depressions and, in wet periods, may be ponded if outlets are lacking.

The Hyde soils have a thicker surface layer and contain more organic matter than the dark, very poorly drained Johnston soils, which occur on the flood plain of streams.

The Hyde soils are of small extent in Prince Georges County. Most areas are wooded. The native vegetation consists of water-loving hardwoods and pond pines. If these soils are drained, limed, heavily fertilized, and otherwise managed well, they are suited to corn, soybeans, and truck crops.

Hyde silt loam (Hy).—This is the soil described for the Hyde series. It is nearly level or has concave relief. The thick, black surface soil, which is rich in organic matter, tends to shrink or subside when the excess water is removed.

Drainage, the major problem of management, is difficult because water moves slowly through the silty clay subsoil. Drained areas are suited to some crops. This soil is severely limited for most nonfarm uses. (Capability unit IIIw–9; drainage group 9–6B; woodland group 1; irrigation group not assigned)

Iuka Series

The Iuka series consists of nearly level to moderately sloping, moderately well drained soils on flood plains, in depressions, on foot slopes, and around the head of drains. These soils are on the Coastal Plain. They consist of recently deposited materials that washed from silty and sandy uplands.

Profile of Iuka fine sandy loam (on the flood plain of Mattawoman Creek, near Bealle):

A1—0 to 10 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

C1—10 to 18 inches, dark yellowish-brown (10YR 4/4) loam; weakly stratified; soft, friable, nonsticky and nonplastic; roots common; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

C2—18 to 30 inches, dark yellowish-brown (10YR 4/4) loam; few, medium, distinct mottles of light brownish gray (10YR 6/2) and few, medium, faint mottles of brown or dark brown (7.5YR 4/4); massive to very weak, very fine, subangular blocky structure; soft, friable, nonsticky and nonplastic; few roots; about 5 percent by volume is fine and medium smooth pebbles; very strongly and extremely acid; abrupt, smooth boundary. 12 to 14 inches thick.

IIC3g—30 to 48 inches +, gray (5Y 5/1) very gravelly loam; few, coarse, prominent mottles of yellowish brown (10YR 5/6); stratified; very friable, nonsticky and nonplastic; about 60 percent by volume is fine and medium, smooth, waterworn pebbles; extremely acid.

In Prince Georges County, the A and C horizons are sandy loam, fine sandy loam, or silt loam. The nonconforming IIC horizon has about the same amount of fine material, but it is very gravelly and in places is sandier than the upper horizons. The depth to the nonconforming horizon is normally about 28 to 36 inches. In places a thin overwash of recent material is on the surface.

The A horizon is dark brown or dark grayish brown. The value in the C horizon ranges from 4 to 6, and chroma generally is 4. The grayish mottling in the C2 horizon occurs within 20 inches of the surface. The IIC3 horizon may be variegated, but the colors in most places indicate long periods of wetness. In some places Iuka soils are at the base of slopes and generally are not subject to flooding, but water may seep from higher lying soils.

The Iuka soils are on the same general kinds of material as the well-drained Ochlockonee soils, the poorly drained Bibb soils, and the very poorly drained Johnston soils. They are similar to the Codorus soils, but Codorus soils developed chiefly from fine materials that washed from areas of weathered acid crystalline rocks and commonly contain much finely divided mica.

The Iuka soils occur in many parts of the county. They are in a few fairly large areas of the flood plains and in many small scattered depressions. These small areas are important to landowners. The native vegetation consists mainly of mixed hardwoods, but in many places the stand contains yellow-poplar.

Iuka fine sandy loam (Ik).—This soil has the profile described for the Iuka series. Most areas are nearly level, but some are gently sloping. This soil occupies the flood plain of streams. Included in mapping were some small areas where the surface layer is somewhat coarser than fine sandy loam.

Poor drainage and the hazard of flooding limit the use of this soil, though it is suited to general farm crops, hay, and pasture. In most places drainage is the most important problem of management. Drainage can be improved by using either V-type drains or tile. (Capability unit IIw–7; drainage group 5; irrigation group 10A; woodland group 4)

Iuka sandy loam, local alluvium, 0 to 2 percent slopes (ImA).—This soil is coarser textured than Iuka fine sandy loam. It is in nearly level upland depressions that have drainage outlets, and it is generally not subject to flooding. Included in mapping were a few gravelly spots.

Drainage is the most important problem of management. Tile is suitable for improving drainage, but ditches should be used to intercept runoff and seepage from adjacent higher soils. If drainage is improved, the soil is suited to many kinds of crops and to hay and pasture. (Capability unit IIw–7; drainage group 5; irrigation group 10A; woodland group 4)

Iuka sandy loam, local alluvium, 2 to 5 percent slopes (ImB).—This soil is on foot slopes and the sloping sides of depressions. Included in mapping were small, very sandy areas and a few gravelly spots. In some places the sand is finer than normal for this soil.

Drainage is normally a more important problem of management than erosion. Tile lines are needed, along with ditches that intercept runoff and seepage from adjacent areas. Under good management, this soil is suited to many crops common in the area. (Capability unit IIw–7; drainage group 5; irrigation group 10A; and woodland group 4)

Iuka silt loam (In).—This soil is on the flood plain of streams and is flooded occasionally. Most of this soil is level or nearly level, but a few areas that have gentle slopes were included.

Wetness is the major problem of management on this soil, and there is a hazard of flooding. V-type ditches are commonly used to improve drainage. The soil is suited to general farm crops, hay, and pasture. (Capability unit IIw–7; drainage group 5; irrigation group 10; and woodland group 4)

Iuka silt loam, local alluvium, 0 to 2 percent slopes (IoA).—This soil is like Iuka silt loam, but it occurs chiefly in upland depressions and is seldom, if ever, flooded. It consists of silty materials that washed from adjacent soils on uplands. Included in mapping were a few places that have a thin layer of sandy material on the surface.

Impeded drainage is the only serious limitation to the use of this soil. Drainage can be improved by using either tile or ditches, but ditches are needed to intercept runoff and seepage from higher soils. If drainage is improved, this soil is suited to most crops common in the area. (Capability unit IIw–7; drainage group 5; irrigation group 10; and woodland group 4)

Iuka silt loam, local alluvium, 2 to 5 percent slopes (IoB).—This soil has somewhat stronger slopes than Iuka silt loam, local alluvium, 0 to 2 percent slopes. Included in mapping were some spots that have coarse gritty material on and near the surface.

Although erosion is a hazard on this soil, drainage is the most important problem of management. In most places ditches are needed to intercept runoff and seepage from adjacent higher areas. (Capability unit IIw–7; drainage group 5; irrigation group 10; and woodland group 4)

Iuka-Urban land complex (Iu).—This complex consists of Iuka soils on flood plains that are used for community developments. Most areas are nearly level, but some are gently sloping.

About 25 percent of each area mapped as this complex consists of Iuka soils like the soil described for the Iuka series, and about 55 percent consists of Iuka soils that have been covered with miscellaneous soil materials to a depth of as much as 18 inches. The rest consists of fills, 18 inches or more in depth, or places where most of the Iuka soil has been cut away.

Most areas of this complex have been filled for streets, buildings, parking lots, and playgrounds. In some areas filling has reduced the severity or frequency of floods. (Drainage group 5; capability unit, irrigation group, and woodland group not assigned)

Iuka, local alluvium-Urban land complex (Ix).—This complex consists of nearly level to gently sloping Iuka soils on local alluvium, not alluvium of the flood plains. It is used for community developments. The soils have been rearranged into complex patterns on the landscape. About 25 percent of each area mapped consists of Iuka soils that have a sandy loam or silt loam surface layer. About 55 percent consists of Iuka soils that have been covered with as much as 18 inches of soil material or have had up to about 20 inches of soil material removed. The rest consists of fills, 18 inches or more in depth, or places where most of the Iuka soil profile has been cut away.

In most places the fill materials are usually a mixture of sand, silt, and clay, but in some places they contain gravel or other materials. In the areas where most or all of the soil has been removed, the exposed surface layer is wet most of the time. (Drainage group 5; capability unit, irrigation group, and woodland group not assigned)

Johnston Series

The Johnston series consists of very poorly drained soils that have a thick, black surface layer and are on flood plains of some streams on the Coastal Plain. The Johnston soils consist of recently deposited silty materials that washed from nearby uplands and a considerable accumulation of decaying vegetation. These soils are level or very nearly level. They are commonly in depressions and are lower than other soils on the flood plain.

Profile of Johnston silt loam (in a wooded area near the U.S. Department of Agriculture Research Center at Beltsville):

A1—0 to 24 inches, black (10YR 2/1) silt loam, high in organic-matter content; weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful to abundant; very strongly acid; abrupt, smooth boundary. 20 to 24 inches thick.

C1g—24 to 32 inches, very dark gray (10YR 3/1) silt loam; few, medium, distinct mottles of dark reddish brown (5YR 2/2); massive; hard, friable, slightly sticky but nonplastic; roots common in upper part; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

C2g—32 to 38 inches, gray (5Y 5/1) silt loam; massive; hard, friable, nonsticky and slightly plastic; very strongly acid and extremely acid; abrupt, smooth boundary. 6 to 8 inches thick.

IIC3g—38 to 48 inches +, gray (5Y 5/1) gravelly sand; stratified; loose; extremely acid.

In Prince Georges County, the normal profile of Johnston soils has a silt loam A horizon, but in places the recent addition of organic matter has made the surface somewhat mucky. In most places the C horizon is loam or silt loam, but the IIC horizon generally consists of waterbearing sand or loamy sand that is gravelly in places. In most places the depth to the nonconforming IIC horizon ranges from 30 to 40 inches.

Normally the A horizon of Johnston soils is black, but in cultivated areas where there has been loss or oxidation of organic matter the plow layer may be very dark gray. The C2g horizon is gray or light gray and is mottled in places with yellowish brown or strong brown. The nonconforming IIC horizon has variable color and is nearly always strongly gleyed. In some places the IIC horizon is underlain by a finer textured and otherwise very different IIIC horizon.

Because Johnston soils are on flood plains there is a high hazard of flooding.

Except for the high content of organic matter, the Johnston soils are on the same general kinds of material as the well drained Ochlockonee, the moderately well drained Iuka, and the poorly drained Bibb soils. The Hyde soils and the Johnston are similar in many respects, but Hyde soils have a thicker surface layer and occur in upland depressions.

The Johnston soils are not extensive in the county. Because these soils are poorly drained, most areas remain in trees. Also, wetness and the hazard of flooding make these soils unsuitable for community development. They can be used as wildlife habitats and seasonally for recreational areas, even in thickly populated places. The native vegetation is hardwoods that tolerate wetness and some pond pines.

Johnston silt loam (Jo).—This is the soil described for the Johnston series. It occurs on flood plains, mostly in the northern and western parts of the county, especially in the areas just east and north of Greenbelt. All of this soil is nearly level.

Excessive wetness and the hazard of flooding are the most important problems of management. Drainage generally is difficult because few places have adequate outlets. Drained areas are suited to corn, soybeans, pasture, and perhaps some truck crops. Where the soil is likely to be flooded frequently, use is mostly limited to grazing, woodland, or wildlife. (Capability unit IIIw–7; drainage group 11–A; woodland group 2; irrigation group not assigned)

Johnston-Urban land complex (Ju).—In this complex are nearly level Johnston soils and disturbed land that is mainly of Johnston soil material. These areas have been used for community developments. Little, if any, of the complex is like the soil described as representative of the Johnston series. About 55 percent has been covered with as much as 18 inches of varied soil materials. Most of the rest is areas where the original soil has been covered with other materials to depths greater than 18 inches.

Areas of Johnston soils have been filled for the construction of streets, buildings, parking lots, and playgrounds. Much of the complex is now under pavement. (Drainage group 11–A; capability unit, irrigation group, and woodland group not assigned)

Keyport Series

The Keyport series consists of deep, moderately well drained soils that have a fine-textured subsoil. The subsoil is mottled in the lower part, and water moves through it slowly or very slowly. These soils developed in thick beds of clay or fine silty clay on the Coastal Plain. The Keyport soils are on nearly level to strongly sloping uplands.

Profile of Keyport silt loam (in a cultivated field between Bealle and Farmington Lodge):

Ap—0 to 9 inches, olive-brown (2.5Y 4/4) silt loam; weak, fine, granular structure; hard, friable, slightly sticky and slightly plastic; roots plentiful; common worm casts; strongly acid and very strongly acid; abrupt, smooth boundary. 8 to 9 inches thick.

B1—9 to 14 inches, yellowish-brown (10YR 5/6) silty clay loam; weak, fine, subangular blocky structure; hard, friable to firm, sticky and slightly plastic; roots fairly plentiful; wormholes common; strongly acid and very strongly acid; clear, smooth boundary. 4 to 6 inches thick.

B21t—14 to 26 inches, yellowish-brown (10YR 5/6) silty clay; moderate, fine, blocky structure; hard, firm, sticky and plastic; few roots; thin, discontinuous, dark yellowish-brown (10YR 4/4) clay coatings; strongly acid and very strongly acid; abrupt, smooth boundary. 10 to 14 inches thick.

B22tg—26 to 40 inches, dark grayish-brown (2.5Y 4/2) clay; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and dark gray (5Y 4/1); strong, fine, blocky structure; hard, firm, sticky and plastic; root channels filled with clay; nearly continuous clay coats of gray and brown; very strongly acid and extremely acid; abrupt, smooth boundary. 12 to 20 inches thick.

B23tg—40 to 54 inches +, very dark gray (5Y 3/1) clay; common, medium, faint mottles of olive gray (5Y 5/2) and common, medium, prominent mottles of brown or dark brown (7.5YR 4/4); strong, fine, blocky structure; hard, firm, sticky and plastic; discontinuous brown or dark-brown (7.5YR 4/4) and dark-gray (5Y 4/1) clay coats and accumulations; extremely acid.

In Prince Georges County, the A horizon of Keyport soils is silt loam or fine sandy loam. In eroded areas that originally had a silt loam A horizon, the plow layer is silty clay loam. The B horizon is heavy clay loam, heavy silty clay loam, silty clay, or clay. In most places the C horizon is clay or fine sandy clay, but in some places this horizon is below a depth of 4 feet. The solum ranges from about 36 to more than 50 inches in thickness.

In unplowed areas the A horizon is grayish brown, gray, yellowish brown, or olive brown. The upper part has lower value and chroma than the lower part. In areas where the surface layer is fine sandy loam, the A horizon is thicker and lighter colored than it is in areas where the surface layer is silt loam. In areas where the surface layer is silty clay loam, the color of the A horizon is nearly always yellowish brown. In most places the upper part of the B horizon is yellowish brown or brownish yellow, and it has no mottling of low chroma. The lower part of the B horizon generally has lower chroma, and the mottles in this part range in chroma from low to high. The C horizon is light gray in most places where it occurs. The mottles in this horizon range in chroma from low to high.

The Keyport soils developed on the same kind of clay as the well-drained Christiana and the poorly drained Elkton soils. Keyport soils are similar in some ways to the Donlonton, Woodstown, and Mattapex soils. The Keyport soils are less olive or greenish in color than the Donlonton soils, which are less dense and tough and which have developed in materials containing greensand. The Keyport soils are less sandy throughout than the Woodstown and are less silty than the Mattapex soils. Water moves through the Keyport soils less readily than it does through the Woodstown and the Mattapex soils.

The Keyport soils are fairly extensive in the county. They are most extensive in the southwestern part of the county but also occur in the northern and western parts. Although they are useful for farming, they tend to be wet, cold, and difficult to work in spring. Planting on these soils is usually late. Seasonal wetness, a fine-textured subsoil, and very slow permeability are problems in developing residential areas. The native vegetation consists of mixed upland hardwoods and a few pines.

Keyport fine sandy loam, 0 to 2 percent slopes (KeA).—This soil is typical of Keyport soils that occur in areas having a fine sandy loam surface layer. In some places this layer contains coarse sand and in other places it contains fine mica. In spots the surface layer is thicker than normal. Most areas of this soil are nearly level, but there are some slight depressions.

Wetness is the most important problem of management. Drainage can be improved by using field ditches as needed and by using tile lines in spots where the sandy surface layer is at least 24 inches thick above the tight subsoil. Placing the tile within the tight subsoil is not advisable, since clay tends to slow the movement of water into the tile. (Capability unit IIw–9; drainage group 6–2B; irrigation group 8; and woodland group 11)

Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded (KeB2).—Except for stronger slopes and more erosion, this soil is like Keyport fine sandy loam, 0 to 2 percent slopes. Included in mapping were areas where the soil is coarser textured and areas where shallow gullies have formed.

Although drainage may be needed, the risk of erosion is the most critical problem of management. Diversion terraces, separated by graded strips of crops, are needed to control runoff. Carefully sodded waterways help to prevent washing and gullying. This soil is not difficult to work; it produces favorable yields of adapted crops. (Capability unit IIe–36; drainage group 6–2B; irrigation group 8; and woodland group 11)

Keyport fine sandy loam, 5 to 10 percent slopes, moderately eroded (KeC2).—This soil, which has a thick sandy surface layer over a tight clay subsoil, is more susceptible to erosion than Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded, because slopes are stronger and runoff is more rapid. The surface layer varies in thickness. Included in mapping were spots that have slopes of more than 10 percent and places where shallow gullies have formed.

The control of erosion is the most important problem in managing this soil, though drainage may be needed for some kinds of crops. To help control erosion and to improve drainage, particularly on long slopes, this soil can be farmed in graded strips between the diversion terraces. (Capability unit IIIe–36; drainage group 6–2B; irrigation group 8; and woodland group 9)

Keyport silt loam, 0 to 2 percent slopes (KpA).—This is the soil described for the Keyport series. The surface layer feels soft and floury, though in spots it is slightly gritty. Included in mapping were some gravelly spots and some depressions where the surface layer is thicker than normal.

Because water moves slowly though the subsoil, drainage is impeded, and the use of this soil for crops is limited. Ditches are better than tile for removing excess water because the subsoil is so slowly permeable that tile does not function properly. If it is drained, this soil produces favorable yields of adapted crops. (Capability unit IIw–8; drainage group 6–2A; irrigation group 12; and woodland group 11)

Keyport silt loam, 2 to 5 percent slopes, moderately eroded (KpB2).—This soil is more sloping and more eroded than Keyport silt loam, 0 to 2 percent slopes. Runoff is more rapid, and the hazard of erosion is greater. In a few areas this soil is only slightly eroded, but in other places a few shallow gullies have formed. In spots, deep plowing has turned up some subsoil material and mixed it into the surface layer.

Because drainage is impeded and water penetrates slowly into the soil, runoff tends to be excessive, especially when the soil is wet. Controlling the erosion is generally more necessary than improving drainage. Contour strips, supported by diversion terraces and sodded waterways, help to control runoff and erosion. (Capability unit IIe–13; drainage group 6–2A; irrigation group 12; and woodland group 11)

Keyport silt loam, 5 to 15 percent slopes, moderately eroded (KpC2).—This soil is steeper than Keyport silt loam, 2 to 5 percent slopes, moderately eroded, and more careful management is required to control erosion. If row crops are grown without intensive control measures, runoff is very rapid, and erosion is excessive. This soil produces favorable yields, however, if it receives the treatment needed. (Capability unit IIIe–13; drainage group 6–2A; irrigation group 12; and woodland group 9)

Keyport silty clay loam, 5 to 10 percent slopes, severely eroded (KrC3).—This soil has lost the original surface layer through erosion. The plow layer consists of silty clay loam that is sticky when slightly wet and very hard when dry. This soil is difficult to work except within a very narrow range of moisture content. In some places the subsoil is redder than normal, and in other places some gullies have formed.

Because runoff is rapid, this soil erodes readily. It is not suited for use more intensive than hay or pasture. (Capability unit VIe–2; drainage group 6–2A; woodland suitability group 17; irrigation group not assigned)

Keyport-Urban land complex, 0 to 10 percent slopes (KuB).—This complex consists of Keyport soils and disturbed land that is mainly of Keyport soil material. These soils are used for community developments. From 15 to 20 percent of each area mapped as this complex consists of Keyport soils that have a silt loam or fine sandy loam surface layer. About 50 percent consists of Keyport soils that have been covered with as much as 18 inches of fill material or has had as much as two-thirds of the original soil profile removed. The rest is land areas covered with fill material, more than 18 inches thick, or areas where nearly all of the Keyport soil profile has been cut away. The fills have variable texture, and the exposed cuts are rich in clay in most places. (Drainage group 6–2A; capability unit, irrigation group, and woodland group not assigned)

Klej Series

The Klej series consists of deep, moderately well drained, very sandy soils on the Coastal Plain. These soils developed in thick beds of highly sandy materials, but in most places finer textured material occurs 4 feet or more from the surface and retains water better than the sandy materials. The Klej soils are on sandy upland flats and in some gently sloping areas.

Profile of Klej loamy sand (in a wooded area on Allentown Road, just north of Andrews Air Force Base):

A11—0 to 3 inches, dark-brown (10YR 3/3) loamy sand; weak, fine, granular structure; loose, nonsticky and nonplastic; roots abundant; very strongly acid and extremely acid; gradual, smooth boundary. 2 to 3 inches thick.

A12—3 to 12 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; loose; roots common; very strongly acid; clear, smooth boundary. 8 to 10 inches thick.

C1—12 to 24 inches, light olive-brown (2.5Y 5/4) loamy sand; single grain to very weak, fine, granular structure; loose; few roots; very strongly acid; clear, smooth boundary. 8 to 12 inches thick.

C2—24 to 54 inches +, light olive-brown (2.5Y 5/4) loamy sand; common, medium, faint mottles of light brownish gray (2.5Y 6/2) and few to common, medium, prominent mottles of strong brown (7.5YR 5/6) and red (2.5YR 4/8); single grain; loose; extremely acid.

In Prince Georges County, Klej soils are loamy sand throughout their profile, except in some places where the lower part of the C horizon is sand. Some fine, smooth pebbles may occur any place in the profile, but they generally are not plentiful.

In most places the plow layer is grayish brown to dark gray. Klej soils have a hue that ranges from 10YR to 2.5YR, but it generally becomes yellower with depth. In the C horizon value ranges from 4 to 6, and chroma ranges from 3 to 6. Mottles in the lower part of the C2 horizon are common and have a chroma of 2 or less, but chroma is higher in some places. Depth to mottling, which normally is the same as depth to the C2 horizon, is between 18 and 30 inches, but in places mottling is as much as 39 inches from the surface.

In some areas a substratum of light-gray, mottled, sticky sandy loam or sandy clay loam occurs within a depth of 5 feet. This substratum is more slowly permeable than the A and C horizons, and seasonally it supports a perched water table.

The Klej developed on the same kinds of sandy material as the somewhat excessively drained and excessively drained Galestown and Evesboro soils, the poorly drained Plummer soils, and the very poorly drained Rutlege soils. The Klej soils are similar to the moderately well drained Woodstown soils, but Woodstown soils are less sandy, particularly in their subsoil, which contains a considerable amount of clay.

The Klej soils are not extensive in Prince Georges County. In most places they are in small, widely scattered spots. The native vegetation is mixed hardwoods and a few pines.

Klej loamy sand (Ky).—This is the only soil of the Klej series mapped in Prince Georges County. Most of this soil is level or nearly level, but in places it is gently sloping.

If this moderately well drained soil is artificially drained, it is suited to corn, soybeans, truck crops, and most other crops. Drainage is fairly easy; tile works especially well. (Capability unit IIIw–10; drainage group 4; irrigation group 1; and woodland group 3)

Leonardtown Series

The Leonardtown series consists of poorly drained, nearly level to gently sloping soils on uplands of the Coastal Plain. These soils have only moderate effective depth to a very dense, hard, brittle fragipan through which water moves very slowly. The Leonardtown soils developed in a mantle of acid silt, probably deposited by wind, over strongly weathered sandy and gravelly materials.

Profile of Leonardtown silt loam (in a wooded area about one-half mile south of T. B.):

A1—0 to 1 inch, dark-gray (5Y 4/1) silt loam; weak, medium, granular structure; soft, very friable, slightly sticky but nonplastic; roots abundant; extremely acid; abrupt, wavy boundary. 1 to 2 inches thick.

A2—1 to 5 inches, light brownish-gray (2.5Y 6/2) silt loam; weak, thin, platy structure; slightly hard, friable, slightly sticky and slightly plastic; roots abundant; extremely acid; clear, smooth boundary. 3 to 5 inches thick.

B2tg—5 to 12 inches, grayish-brown (2.5Y 5/2) heavy silt loam; abundant, medium, faint mottles of light brownish gray (2.5Y 6/2) and common, medium, distinct mottles of olive yellow (2.5Y 6/6) and yellowish brown (10YR 5/4); weak to moderate, medium, subangular blocky structure; hard, firm, slightly sticky and slightly plastic; roots plentiful; thin clay films; old root channels filled with dark-gray (5Y 5/1) silt; extremely acid; abrupt, smooth boundary. 6 to 8 inches thick.

Bx1—12 to 21 inches, grayish-brown (2.5Y 5/2) fine silty clay loam; common, medium, prominent mottles of strong brown (7.5YR 5/6); compound structure; strong, medium and thick, platy and strong, medium, subangular blocky; very dense; very hard, very firm and brittle, sticky and plastic; few roots; gray (N 5/0) silt coats on horizontal faces and strong-brown (7.5YR 5/6), prominent clay coats on vertical faces; extremely acid; abrupt, smooth boundary. 8 to 12 inches thick.

IIBx2—21 to 31 inches, gray (5Y 5/1) heavy loam, variegated with gray (N 5/0); common, medium, prominent mottles of yellowish brown (10YR 5/6); compound structure; strong, coarse, prismatic and strong, medium, platy; very dense and compact; very hard, very firm and very brittle, slightly sticky and slightly plastic; few fine roots between plates and prisms; thick, prominent, strong-brown (7.5YR 5/6) clay coats on vertical faces of prisms; coats decrease in thickness with depth and are discontinuous on upper surface of plates; extremely acid; diffuse boundary. 9 to 12 inches thick.

IICx—31 to 49 inches, gray (5Y 5/1) heavy loam, variegated with gray (N 5/0); common, coarse, prominent mottles of reddish yellow (7.5YR 7/6); massive; very hard, very firm, and brittle; slightly sticky and slightly plastic when wet; few fine roots in upper part; extremely acid; diffuse boundary. 15 to 20 inches thick.

IIC2g—49 to 70 inches +, gray (N 5/0) loam; abundant, coarse, prominent mottles of strong brown (7.5YR 5/6); massive; hard, friable to firm, very slightly sticky and nonplastic; extremely acid.

The A horizon of Leonardtown soils is silt loam that has a very high content of silt. The B2tg and Bx1 horizons are heavy silt loam or silty clay loam that contains much very fine silt. In most places the material beneath the Bx1 horizon is loam and contains considerably more sand than the upper horizons. In places the IIC2g horizon is sandy, or gravelly to extremely gravelly, or both.

In most places the plow layer is dark grayish brown (2.5Y 4/2). In places the B2tg horizon has a chroma of 3 and a hue of 5Y or 10YR. Below the B2tg horizon, hue is 2.5Y or 5Y, the matrix value is 5 or 6, and chroma is 1 or more commonly 2. Some mottling of low chroma occurs, but mottling that has high chroma and a hue of 2.5Y, 10YR, or 7.5YR is more common.

The Bx horizons are always strongly expressed, but the IICx horizon has little or no structure, though it is commonly about as tough, dense, and compact as the Bx horizons.

The Leonardtown soils are on the same kinds of material as the well drained Chillum and the moderately well drained Beltsville soils. The Leonardtown soils have about the same color and drainage as the Elkton and Othello soils and a denser, harder subsoil. Also, they contain considerably less clay than the Elkton soils.

The Leonardtown soils are little used for farming. Most areas remain in trees, but cleared areas are used for pasture and hay in some places. Because they are poorly drained, slowly permeable, and have other adverse characteristics, Leonardtown soils are poorly suited to residential and industrial development. The native vegetation is mostly wetland hardwoods, though there are a few pond pines, loblolly pines, and Virginia pines.

Leonardtown silt loam, 0 to 2 percent slopes (LeA).—This is the soil described as typical of the Leonardtown series. Included in mapping were spots where the surface layer is sandy. In some areas where plowing has been deep, some of the subsoil material has been mixed with the surface soil.

Poor surface drainage, very slow internal drainage, low fertility, and a restricted root zone strongly limit the use of this soil. (Capability unit IVw–3; drainage group 8–3A; woodland suitability group 11; irrigation group not assigned)

Leonardtown silt loam, 2 to 5 percent slopes (LeB).—Except for steeper slopes, this soil is similar to the soil described for the series. Included in mapping were small areas that are somewhat sandy. Also included were areas where subsoil material has been mixed with the surface soil, small eroded spots, and places where shallow gullies have formed.

Use of this soil is limited by a hazard of erosion, as well as by the same limitations that restrict the use of Leonardtown silt loam, 0 to 2 percent slopes. (Capability unit IVw–3; drainage group 8–3A; woodland suitability group 11; irrigation group not assigned)

Made Land

This miscellaneous land type consists of areas where soil materials have been disturbed in garbage and other refuse disposal and other leveling and filling operations.

Made land (Ma).—This mapping unit consists mainly of areas in housing developments where the soil has been removed in construction or has been covered by fill material. The soils can no longer be identified by series or as single soils. Some areas were included where garbage and other kinds of refuse have been dumped and buried. Also included are areas that have been disturbed in construction.

This land is not suitable for farming. It is idle and is used mainly for residential, commercial, and other developments. (Capability unit, drainage group, irrigation group, and woodland group not assigned)

Magnolia Series

The Magnolia series consists of deep, well-drained soils that developed in old silty and sandy sediments. They are on nearly level to moderately sloping, old alluvial terraces along the Potomac River in the southern part of the county.

Profile of Magnolia silt loam (in a cultivated field at Fort Foote):

Ap—0 to 9 inches, dark reddish-brown (5YR 3/4) silt loam; weak, very fine, granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

A2—9 to 15 inches, yellowish-red (5YR 5/6) silt loam; weak, fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; strongly acid; clear, wavy boundary. 4 to 8 inches thick.

B21t—15 to 19 inches, dark-red (10R 3/6) silty clay loam; moderate, medium, subangular blocky structure; very hard, firm, sticky and plastic; roots common; discontinuous clay coats; very strongly acid; abrupt, wavy boundary. 4 to 10 inches thick.

B22t—19 to 31 inches, dark-red (10YR 3/6) silty clay; compound structure: strong, coarse, subangular blocky and strong, medium, blocky; hard, firm, slightly sticky but very plastic; roots common; distinct, continuous, dark-red clay coats; very strongly acid; abrupt, wavy boundary. 10 to 18 inches thick.

B23t—31 to 41 inches, red (10R 4/6) clay loam with white (10YR 8/1) variegations amounting to about 10 percent; weak, medium, blocky structure; hard, friable, nonsticky but slightly plastic; few roots; thin, discontinuous clay coats; occasional fine pebbles in lower part; very strongly acid; abrupt, smooth boundary. 7 to 10 inches thick.

B3—41 to 50 inches, red (10R 4/6) clay loam with white (10YR 8/1) variegations amounting to about 10 percent; massive; hard, firm, nonsticky and nonplastic; few roots; very strongly acid; clear, wavy boundary. 7 to 10 inches thick.

C—50 to 60 inches +, red (10R 4/6) sandy loam; massive; loose, very friable, nonsticky and nonplastic; very strongly acid.

The A horizon of Magnolia soils is silt loam or fine sandy loam. The B horizon is clay loam, silty clay loam, fine sandy clay, light silty clay, or light clay. The content of clay in the Bt horizon ranges from 35 to 50 percent. The C horizon is sandy loam, sandy clay loam, or light clay loam. In some places some fine smooth pebbles are in the lower part of the solum and in the C horizon. The solum ranges from about 36 to 72 inches in thickness.

Undisturbed areas have a thin, dark-brown A1 horizon. The Bt horizon is red or dark red and has a hue of 10R or, in places, 2.5YR. Value in the B horizon is 3 or 4, and chroma ranges from 6 to 8. When it is moist, part of the Bt horizon generally has a value of not more than 3. The C horizon is variable in color but is normally red or reddish. The white variegations in the B23t and B3 horizons are of unoxidized and uncoated soil material. These variegations may also occur in the C horizon, or they may be lacking throughout the profile.

The Magnolia are similar to the Sunnyside and the Christiana soils but have a thicker surface layer than the Christiana soils and are less sandy than the Sunnyside

soils. Also, Magnolia have a more intensively red subsoil than the Sunnyside soils.

The Magnolia soils are not extensive in Prince Georges County. They are good soils for farming and for many other uses. Control of erosion is the main problem of management. The native vegetation is upland hardwoods, mainly oak.

Magnolia fine sandy loam, 2 to 5 percent slopes, moderately eroded (MfB2).—This soil is typical of Magnolia soils that occur in areas that have a fine sandy loam surface layer. The risk of erosion is moderate. Some areas are only slightly eroded, and a few other places are severely eroded. Included in mapping were a few areas that are level or nearly level.

This soil produces favorable yields of tobacco of good quality. It has good moisture-holding capacity. Crop rotations, winter cover crops, contour strips, and other conservation measures are needed to protect this soil from erosion. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Magnolia silt loam, 2 to 5 percent slopes, moderately eroded (MgB2).—This soil is similar to the soil described for the Magnolia series. It is sloping enough for the erosion hazard to be moderate. The surface layer feels soft or floury. Some areas are uneroded or only slightly eroded. Included in mapping were a few areas that are level or nearly level.

This soil is well suited to most general crops and produces favorable yields of tobacco. In the crop rotations, a hay crop is needed at least 1 year in every 3 or 4. Also needed are contour strips in all fields that have long slopes. The waterways should be kept in sod. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Magnolia silt loam, 5 to 10 percent slopes, moderately eroded (MgC2).—This soil is steeper and more susceptible to erosion than Magnolia silt loam, 2 to 5 percent slopes, moderately eroded. Some places are only slightly eroded, and some are severely eroded. Included in mapping were a few areas that have a fine sandy loam surface layer.

Crop rotations, contour stripcropping, diversion terraces, and sod waterways are needed to help check erosion on this soil. (Capability unit IIIe–4; irrigation group 13; woodland group 8; drainage group not assigned)

Manor Series

The Manor series consists of very deep, well-drained to somewhat excessively drained soils that developed in materials weathered in place from fairly soft to moderately hard, highly micaceous rocks. These soils are on sloping to very steep Piedmont uplands along the Montgomery County line.

Profile of Manor loam (in a wooded area about 2 miles northwest of Laurel):

A11—0 to 1 inch, dark grayish-brown (10YR 4/2) loam; weak, fine, granular structure; loose; nonsticky and nonplastic; roots abundant; strongly acid; abrupt, smooth boundary. 1 to 2 inches thick.

A12—1 to 10 inches, dark yellowish-brown (10YR 4/4) loam; weak, medium, granular structure; soft, very friable, slightly sticky but nonplastic; roots common to plentiful; abundant fine flakes of mica; strongly acid; clear, smooth boundary. 8 to 10 inches thick.

B2—10 to 20 inches, yellowish-red (5YR 4/6) loam; weak, medium, subangular blocky structure; soft to slightly hard, friable, slightly sticky but nonplastic; many roots; abundant mica flakes increase in amount with depth; strongly acid; clear, wavy boundary. 8 to 12 inches thick.

C—20 to 120 inches +, variegated and layered brown (10YR 5/3), yellowish-red (5YR 4/8), and yellow (10YR 7/6) saprolite of highly micaceous loam texture; inherent schistose (platy) structure; few roots in upper 20 inches; strongly acid and very strongly acid.

In most cultivated areas the plow layer is dark yellowish brown (10YR 4/4) to dark brown (7.5YR 4/4). The A12 horizon ranges from dark yellowish brown (10YR 4/4) to light reddish brown (5YR 6/4). The B2 horizon ranges from strong brown (7.5YR 5/6 or 5/8) to red (2.5YR 5/6 or 5/8), but most commonly it is yellowish red (5YR 4/6 to 5/8). In places the B2 horizon contains slightly more clay than the A and C horizons, which have almost identical texture. The bands or variegations in the saprolite may be of almost any color, but yellowish red, red, or weak red generally dominates. In uneroded areas the solum ranges from about 15 to 25 inches in thickness. The saprolite is very thick and gradually merges with the parent schist, which is commonly 6 to 10 feet or more from the surface. Soft, friable fragments of schist occur in the profile in places, but they are not abundant and are hard in only a few places.

In places in Prince Georges County, the Manor soils were probably once capped by Coastal Plain materials, for there are remnants of what appear to be rounded Coastal Plain pebbles on the surface or in the plow layer.

Except for the Glenelg soils, the Manor soils are the only soils in Prince Georges County that developed directly from bedrock. The Manor soils have almost uniform texture throughout, whereas the Glenelg soils have a subsoil that is finer textured than its surface soil. In most places the Manor soils are redder than the Glenelg and are deeper to bedrock.

The Manor soils are not extensive in Prince Georges County. In places they are particularly important in community development. They occur chiefly along the Montgomery County line, where they extend from Takoma Park and Chillum to the Naval Ordnance Laboratory, and in the extreme northwestern part of the county, west of Laurel. The native vegetation is upland hardwoods, mainly oak.

Manor loam, 3 to 8 percent slopes, moderately eroded (MhB2).—This soil is the one described for the Manor series. Slope and the hazard of erosion somewhat limit use. Because this soil is micaceous, it is particularly susceptible to erosion. Included in mapping were gravelly spots. (Capability unit IIe–25; irrigation group 10; woodland group 43; drainage group not assigned)

Manor loam, 8 to 15 percent slopes, moderately eroded (MhC2).—If this soil is cultivated regularly, special care is needed to prevent further damage through erosion. Included in mapping were some gravelly spots and a few small areas that are severely eroded. (Capability unit IIIe–25; irrigation group 10; woodland group 43; drainage group not assigned)

Manor loam, 15 to 25 percent slopes, moderately eroded (MhD2).—This soil is suitable for only occasional cultivation because the risk of erosion is high. Included in mapping were some gravelly spots and a few small areas that are somewhat wetter than normal. (Capability unit IVe–25; woodland group 44; irrigation group 10; drainage group not assigned)

Manor loam, 25 to 60 percent slopes, moderately eroded (MhF2).—This is the steepest Manor soil in the county. It consists mostly of slopes cut by the Patuxent River in

a general area northwest of Laurel. This soil is mostly wooded. It probably should remain in trees so that runoff is controlled and the areas are protected for wildlife and for their esthetic value. (Capability unit VIIe–3; woodland group 45; drainage group and irrigation group not assigned)

Manor-Urban land complex, 8 to 15 percent slopes (MkC).—This complex consists of Manor soils and disturbed land that is mainly of Manor soil material. These areas have been disturbed by man and are used for community developments. About 10 percent of each area mapped as this complex consists of Manor soils like the soil described for the Manor series, and 45 percent consists of disturbed Manor soils that are covered with as much as 18 inches of soil material or have had as much as two-thirds of their soil profile removed. The surface layer of these disturbed areas has variable texture.

About 55 percent of this unit consists of fills, 18 inches or more in depth, or places where most of the Manor soil profile has been cut away. The surface layer is loam in most places. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Marr Series

The Marr series consists of deep, well-drained soils that developed in old deposits of fine sandy to very fine sandy materials containing a considerable amount of silt and clay. The sand particles in the Marr soils are especially fine and of uniform size. The Marr soils occur on the higher uplands of the Coastal Plain. They generally range from nearly level to rolling, but some areas are steep.

Profile of Marr fine sandy loam (in a cultivated field on Naylor Road, about 50 yards from Nottingham Road):

Ap—0 to 6 inches, dark-brown (10YR 3/3) fine sandy loam; weak, medium, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful; strongly acid; clear, smooth boundary. 6 to 8 inches thick.

B1—6 to 12 inches, brown (7.5YR 5/4) very fine sandy loam; weak, medium, subangular blocky structure; slightly hard, friable, nonsticky but very slightly plastic; roots common; abundant pores; strongly acid; gradual, smooth boundary. 4 to 6 inches thick.

B21t—12 to 22 inches, strong-brown (7.5YR 5/6) very fine sandy clay loam; moderate, medium, subangular blocky structure; hard, friable to firm, slightly sticky and slightly plastic; few roots; thin, nearly continuous clay coatings; strongly acid and medium acid; gradual, smooth boundary. 10 to 12 inches thick.

B22t—22 to 34 inches, strong-brown (7.5YR 5/8) heavy fine sandy clay loam; weak, medium, subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; very few roots; distinct, discontinuous, strong-brown (7.5YR 5/6) clay coatings; very strongly acid; clear, smooth boundary. 8 to 12 inches thick.

C—34 to 50 inches +, variegated brownish-yellow (10YR 6/8) and reddish-yellow (7.5YR 6/6) fine sandy loam to very fine sandy loam; massive; soft, very friable, nonsticky and nonplastic; strongly and very strongly acid.

In places the plow layer is thicker than the one described. In some uneroded areas it is dark grayish brown (10YR 4/2) or very dark grayish brown (10YR 3/2). In the severely eroded areas the plow layer is brown (10YR 5/3), yellowish brown (10YR 5/4), or brown (7.5YR 5/2 or 5/4) and is nearly structureless. In these areas material from the B horizon has been mixed into the plow layer. Thickness of the solum ranges from about 36 inches in uneroded areas to less than 30 inches in the more severely eroded or the steeper areas. In some places the B21t and B22t horizons are reddish yellow (7.5YR 6/6 or 6/8). The C horizon is commonly very thick, and in some places it approaches loamy fine sand or loamy very fine sand as depth increases. In places a IIC2 horizon that contains glauconite is below a depth of 5 or 6 feet.

The Marr soils are on the same kinds of material as the well-drained Howell and Westphalia soils. The Marr are less silty than the Howell soils and have a less strongly developed subsoil. They contain less fine and very fine sand than the Westphalia soils, which have a thin, weakly developed subsoil. The Marr soils occur with the Sassafras, Collington, or Monmouth soils in some places but are brighter colored and generally more yellowish than those soils.

Although the Marr soils are in fairly large areas on distinct geologic formations, their total extent in the county is not great. Marr soils are important for farming. Most areas have been farmed since early colonial times, but some areas are now used for community development. The native vegetation consists mainly of mixed upland hardwoods, but Virginia pine grows in many areas.

Marr fine sandy loam, 0 to 2 percent slopes (MlA).—This is the soil described for the Marr series. Included in mapping were some areas of very fine sandy loam.

This soil is well suited to most general crops and to deep-rooted crops. It has a good moisture-holding capacity and produces favorable yields under good management. The tobacco grown is generally of high quality. Where slopes are long, contour tillage and grassed waterways are needed to help control runoff, but there are no other significant limitations. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded (MlB2).—This soil is more sloping than Marr fine sandy loam, 0 to 2 percent slopes, and the risk of erosion is moderate. In some places it is thinner or shallower to the underlying sand than the less sloping soil, and in a few areas the surface layer contains some sticky subsoil material. Included in mapping were places that are only slightly eroded and a few places where shallow gullies have formed. Also included were some areas that have a surface layer of very fine sandy loam.

This soil is well suited to most general crops and to deep-rooted crops. If properly managed, it produces favorable yields of tobacco, truck crops, corn, small grain, hay, and pasture. A good supply of moisture is available to plants. Crop rotations, winter cover crops, and contour strips are needed to protect this soil from further erosion. Waterways should be kept in sod. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Marr fine sandy loam, 2 to 6 percent slopes, severely eroded (MlB3).—This soil has probably been farmed since the seventeenth century, but it has not been well protected. The present surface layer consists mostly of material from the subsoil and is of a brighter brown color than the original surface soil. Also, it is somewhat sticky and generally is in poor tilth. Fairly complex conservation measures are needed for adequate protection of this soil. They include rotation of crops, contour strips, diversion terraces, and sodded waterways. (Capability unit IIIe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded (MIC2).—Except for steeper slopes, this soil is like the one described for the Marr series. In some places the surface layer contains some subsoil material, and in a few places shallow gullies have formed. Included in mapping were a few areas that have a very fine sandy loam surface layer.

This soil is suited to general crops and to deep-rooted crops, but it is susceptible to serious damage through erosion. Under good management, it produces tobacco of fine quality. A good supply of moisture is generally available to plants, except during long dry periods. Crop rotations, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Marr fine sandy loam, 6 to 12 percent slopes, severely eroded (MIC3).—Because this soil is severely eroded, the surface layer consists mostly of the brown subsoil material. Gullies, some of them deep, have formed in places. Included in mapping were areas that have a very fine sandy loam surface layer.

This soil is suited to only an occasional cultivated crop. Favorable yields of most general crops can be produced under good management. The quality of tobacco is usually high. Hay and permanent pasture are suitable uses. Some of the practices needed for protection against erosion are crop rotation, contour cultivation, contour stripcropping with buffer strips, crop residue management, and minimum tillage. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Marr fine sandy loam, 12 to 20 percent slopes, severely eroded (MID3).—The surface layer of this severely eroded soil consists mainly of brown, sticky subsoil material. Gullies, some of them deep, have formed in many places. A few areas are only slightly eroded. Included in mapping were areas that have a very fine sandy loam surface layer.

This soil is not suitable for cultivation, but well-established grasses or legumes could be grazed or cut for hay. Steepness severely limits the nonfarm uses of this soil. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Marr fine sandy loam, 20 to 35 percent slopes (MIE).—This steep soil is gullied in places. The gullies are many, and some of them are deep. Included in mapping were areas that have a surface layer that is silty or of very fine sandy material. Also included were some areas that have slopes of more than 35 percent.

Most areas of this soil are still wooded and probably should remain so. Sodding benefits cleared areas and provides limited grazing or forage. Planting of trees is also beneficial. Steepness severely limits the nonfarm uses of this soil. (Capability unit VIe–2; woodland group 9; drainage group and irrigation group not assigned)

Matapeake Series

The Matapeake series consists of deep, well-drained soils that developed in a mantle of wind-deposited acid silt and very fine sand over older deposits of sandy and, in places, gravelly materials. The Matapeake soils are on nearly level or rolling to fairly steep uplands of the Coastal Plain.

Profile of Matapeake fine sandy loam (in a cultivated field about 1 mile southeast of Upper Marlboro):

Ap—0 to 7 inches, brown or dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful; common fine pores; slightly acid (lined); abrupt, smooth boundary. 7 to 9 inches thick.

B21t—7 to 24 inches, brown or dark-brown (7.5YR 4/4) light silty clay loam; strong, fine, blocky structure; hard, friable and firm, plastic and slightly sticky; roots common; many old root channels and insect burrows; distinct, nearly continuous clay coatings; strongly acid; gradual, smooth boundary. 12 to 20 inches thick.

B22t—24 to 34 inches, strong-brown (7.5YR 5/6) light silty clay loam; weak, medium, blocky structure; hard, friable, slightly sticky and slightly plastic; very few roots; fine, smooth pebbles in lower few inches; distinct but discontinuous clay coatings; very strongly acid; abrupt, smooth boundary. 8 to 25 inches thick.

IIC—34 to 60 inches +, brown or dark-brown (7.5YR 4/4) gravelly sandy loam; loose; very strongly acid and extremely acid.

In Prince Georges County, the A horizon of Matapeake soils is silt loam or fine sandy loam. The Bt horizon is heavy silt loam or light silty clay loam, and its content of clay ranges from about 18 to 30 percent. In places a conforming C horizon of silt loam occurs between the solum and the nonconforming coarser textured IIC horizon. In those places the solum normally is considerably thicker than it is in the profile described. The solum generally ranges from about 28 to 40 inches in thickness, but where a conforming C horizon occurs, the solum may be as much as 60 inches thick.

In wooded areas there are a thin, dark-brown to very dark grayish-brown A1 horizon and a yellowish-brown A2 horizon. The B horizon has a hue of 10YR or 7.5YR, a value of 4 or 5, and chroma that ranges from 4 to 6 and, in a few places, to 8. In most places part of the Bt horizon has chroma of 4. The silty C horizon, if it occurs, is essentially the same color as the Bt horizon, but the nonconforming IIC horizon is variable in color. The IIC horizon is not gravelly in all places. More commonly it is sandy loam or loamy sand and contains little or no gravel. Both the C and IIC horizons are loose to very friable.

The Matapeake soils are on the same kinds of material as the moderately well drained Mattapex soils and the poorly drained Othello soils. The Matapeake soils are more silty than the Sassafras and the Marr soils. They have a less strongly developed subsoil than the Howell soils and are not so brightly colored.

The Matapeake soils are not extensive in Prince Georges County. They generally occur on bluffline summits along major waterways, including the Potomac and the Patuxent Rivers. The Matapeake soils are suitable for many uses. Use for farming is limited only by the hazard of erosion in the sloping areas. The native vegetation is mixed upland hardwoods, mainly oak.

Matapeake fine sandy loam, 0 to 2 percent slopes (MmA).—This is the soil described for the Matapeake series. It occurs mostly on river terraces and is deep and level or nearly level.

This soil is well suited to most general crops and to deep-rooted crops. It has a good moisture-holding capacity and produces favorable yields under good management. The tobacco grown is of high quality. In fields where slopes are long, contour tillage and grassed waterways are needed to help control runoff, but there are no other significant limitations to farming. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded (MmB2).—On this gently sloping soil,

the risk of erosion is moderate. In some places this soil is thinner than normal to the underlying sand, and there are a few severely eroded areas.

This soil is well suited to most general crops and to deep-rooted crops. If properly managed, it produces favorable yields of truck crops, corn, small grain, hay, and pasture. It also produces favorable yields of high-quality tobacco. This soil has good moisture-holding capacity. Crop rotations, winter cover crops, and contour strips are needed to protect this soil from erosion. Waterways should be kept in sod. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Matapeake silt loam, 0 to 2 percent slopes (MnA).—This soil is typical of Matapeake soils that occur where the surface layer is silt loam. The surface layer generally feels soft and floury, but in places it contains some gritty materials. Included in mapping were a few areas that have a pale-brown subsoil and silty underlying material.

This soil is well suited to general crops and to deep-rooted crops. Under proper management, it produces favorable yields of corn, wheat, hay, and pasture. Yields of tobacco are also favorable on this soil, but quality may not be so good as that of tobacco grown on the sandier Matapeake soils. This soil holds a good supply of moisture available for plants. It is not difficult to work when the surface layer is not wet. (Capability unit I–4; irrigation group 13; woodland group 7; drainage group not assigned)

Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MnB2).—On this gently sloping soil the risk of erosion is moderate. The surface layer feels soft and floury, but in some places this layer contains some gritty material. Also, a few spots are gravelly. Some areas are eroded or only slightly eroded, and a few areas are severely eroded.

This soil is well suited to most general crops, and it produces favorable yields of tobacco. A hay crop is needed at least one year in every 3 or 4. Also needed are contour strips in fields that have long slopes. Waterways should be kept in sod. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Matapeake silt loam, 5 to 10 percent slopes, moderately eroded (MnC2).—Except for steeper slopes and a greater hazard of erosion, this soil is like Matapeake silt loam, 2 to 5 percent slopes, moderately eroded. Erosion is only slight in some places, but in other places a few shallow gullies have formed. Included in mapping were a few areas that have some sandy material in their surface layer. Also included were a few wet spots.

This soil is well suited to general crops and to deep-rooted crops. It produces favorable yields of tobacco, but the tobacco may be of low quality. Crop rotations, contour stripcropping, diversion terraces, and sod waterways are needed to help check erosion. (Capability unit IIIe–4; irrigation group 13; woodland group 8; drainage group not assigned)

Matapeake silt loam, 5 to 10 percent slopes, severely eroded (MnC3).—This soil is shallower to the underlying sandy materials than the soil described as typical of the Matapeake series. Most of the original surface soil has been removed through erosion, and the surface layer now contains much subsoil material. Gullies, some of them deep, have formed in places. Included in mapping were a few areas where drainage is impeded.

Although this soil is suited to general crops, only occasional cultivation is advisable. Under good management, yields of tobacco are generally favorable, but quality may be low. Among the conservation practices needed are contour cultivation, stripcropping, minimum tillage, and terracing in some places. Waterways should be kept in sod. (Capability unit IVe–3; irrigation group 13; woodland group 13; drainage group not assigned)

Matapeake silt loam, 10 to 15 percent slopes, moderately eroded (MnD2).—This soil is too steep for frequent cultivation. In places the surface layer contains a considerable amount of fine sand. Some areas are severely eroded, and other areas are only slightly eroded. Gullies, some of them quite deep, have formed in some places. Included in mapping were a few small areas that have impeded drainage.

This soil can be cultivated only about once in every 5 years, and then strong conservation practices are needed that include protective vegetation in the crop rotation. (Capability unit IVe–3; irrigation group 13; woodland group 8; drainage group not assigned)

Matapeake silt loam, silty substratum, 2 to 5 percent slopes, moderately eroded (MoB2).—This soil is similar to Matapeake silt loam, 2 to 5 percent slopes, moderately eroded, but its profile is much thicker. The subsoil is underlain by stratified silt deposits, instead of the sandy material that ordinarily underlies Matapeake soils. These silt deposits have more water-holding capacity than the sandy material.

This soil is suitable for about the same farm uses as Matapeake silt loam, 2 to 5 percent slopes, moderately eroded. It has been mapped separately from that soil primarily because of different problems in engineering and in some nonfarm uses. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Matapeake-Urban land complex, 0 to 5 percent slopes (MpB).—This complex consists of the more nearly level areas of Matapeake soils and of disturbed land that is mainly of Matapeake soil material. These areas have been used for community developments. About 5 percent of areas mapped as this complex consists of undisturbed Matapeake soils. About 60 percent consists of original Matapeake soils that have been covered with as much as 18 inches of soil material or have had as much as two-thirds of the soil profile removed. The rest consists of Matapeake soils that have been covered to a depth of 18 inches or more and places where most of the Matapeake soil profile has been cut away. The fill material covering these areas has variable texture. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Matapeake-Urban land complex, 5 to 15 percent slopes (MpC).—Except for steeper slopes, this complex is similar to Matapeake-Urban land complex, 0 to 5 percent slopes. It occurs in areas where the Matapeake soils have been graded, filled, and otherwise disturbed and rearranged. Buildings, streets, and sidewalks cover from 10 to 40 percent of the surface.

About 10 percent of each area mapped as this complex consists of Matapeake soils that have not been rearranged. About 50 percent consists of Matapeake soils that have been filled or covered with as much as 18 inches of soil material or have had as much as two-thirds of the profile removed. The rest consists of areas that have been covered by fills, 18 inches or more in depth, or places where

most of the Matapeake soil profile has been cut away. The fill material has variable texture, but it is mostly silty where local soil material has been used. In areas of deep cuts, the exposed surface may be sandy, like the typical substratum in the Matapeake soils. (Capability unit, drainage group, irrigation group, and woodland group not assigned)

Matawan Series

The Matawan series consists of deep, moderately well drained soils that have a thick, sandy surface layer and a clayey subsoil through which water moves slowly. These soils developed in a sandy mantle over older clayey deposits. They are on nearly level to moderately sloping uplands of the Coastal Plain.

Profile of Matawan loamy sand (in an idle area about 500 feet east of State Route 5 at Clinton):

Ap—0 to 7 inches, brown (10YR 5/3) loamy sand; weak, fine, granular structure; loose; few roots; strongly acid; abrupt, smooth boundary. 7 to 10 inches thick.

A2—7 to 20 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, granular structure; loose; few roots; very strongly acid and extremely acid; abrupt, smooth boundary. 6 to 12 inches thick.

B21t—20 to 30 inches, yellowish-brown (10YR 5/4) light sandy clay loam; few, fine, prominent mottles of light gray (5Y 7/1), mostly in lower part; weak, medium, blocky structure; hard, firm, slightly sticky and slightly plastic; very few roots; faint clay films; very strongly acid and extremely acid; gradual, wavy boundary. 0 to 10 inches thick.

IIB22t—30 to 42 inches, yellowish-brown (10YR 5/6) fine sandy clay loam or clay loam; many, coarse, prominent mottles of light gray (5Y 7/1); weak, coarse, blocky structure; very hard, firm, sticky and plastic; distinct, discontinuous clay coatings; very strongly acid; gradual, wavy boundary. 8 to 15 inches thick.

IICg—42 to 50 inches +, light-gray (5Y 7/1) fine sandy clay, irregularly mottled with yellowish brown (10YR 5/6); massive; very hard, very firm, sticky and plastic; very strongly acid.

In Prince Georges County, the A horizon of Matawan soils is loamy sand or fine sandy loam. The B21t horizon ranges from heavy sandy loam to clay loam and becomes finer with depth. The IIB22t horizon contains more clay than the B21t. The C horizon is heavy sandy clay loam or finer, but in many places it consists of layers of clay or sandy clay stratified with layers of sandy loam or sandy clay loam. Additional nonconforming C horizons of almost any texture may occur at greater depths.

In wooded areas the A1 horizon is grayish brown to dark grayish brown and ranges from 4 to 6 inches in thickness. The A horizon has a hue of 2.5Y in many places and is yellower and less brown than the A horizon described. The matrix of the B2t horizon may be yellowish brown, pale olive, or light olive brown. In some places a part of the B2t horizon has mottling of low chroma. The IIC horizon commonly has a more yellow hue, a higher value, and a lower chroma than the A and B horizons. In many places it is definitely gleyed. The solum ranges from about 30 inches to nearly 50 inches in thickness.

The Matawan soils are on the same or similar kinds of material as the well-drained and somewhat excessively drained Muirkirk soils. The Matawan soils are similar to the Woodstown soils in drainage but have a thicker surface layer and have developed in materials less uniform in texture.

Matawan fine sandy loam, 0 to 2 percent slopes (MrA).—This soil is typical of Matawan soils that occur in areas where the soil is fine sandy loam to a depth of about 20 inches. Erosion is not a hazard. The somewhat impeded drainage is the only significant limitation to use of this soil, and drainage is easily improved. Included in mapping were a few areas that have a slightly silty surface layer. (Capability unit IIw–10; drainage group 3–A; irrigation group 4; woodland group 3)

Matawan fine sandy loam, 2 to 5 percent slopes, moderately eroded (MrB2).—Although this soil has impeded drainage, the hazard of erosion is a more important problem of management. Included in mapping were some spots that have slightly coarser sand in the surface layer and a few areas that are somewhat silty. (Capability unit IIe–36; drainage group 3–A; irrigation group 4; woodland group 3)

Matawan fine sandy loam, 5 to 10 percent slopes, moderately eroded (MrC2).—The erosion hazard is more severe on this strongly sloping soil than it is on Matawan fine sandy loam, 2 to 5 percent slopes moderately eroded. Consequently, better protective measures are needed to keep this soil suitable for continued use. Included in mapping were a few small areas where the surface layer is sandier than fine sandy loam. Also included were a few areas that are severely eroded and have deep gullies. (Capability unit IIIe–36; drainage group 3–A; irrigation group 4; woodland group 3)

Matawan loamy sand, 0 to 2 percent slopes (MsA).—This is the soil described for the Matawan series. Loamy sand extends from the surface to a depth of about 20 inches.

This soil is easier to work and distinctly easier to drain than the Matawan fine sandy loams. Seasonal wetness is normally the most important problem of management, but drainage is not needed for some crops and for other uses. This soil, however, has low moisture-holding capacity. (Capability unit IIw–10; drainage group 3–B; irrigation group 1; woodland group 3)

Matawan loamy sand, 2 to 5 percent slopes (MsB).—The hazard of erosion on this sloping soil is generally a more important problem of management than impeded drainage. Included in mapping were some areas where the surface layer has finer sand than is typical. (Capability unit IIe–36; drainage group 3–B; irrigation group 1; woodland group 3)

Mattapex Series

The Mattapex series consists of deep, moderately well drained soils through which water moves readily to somewhat slowly. These soils developed in a thin mantle of wind-deposited silt and very fine sand underlain by older deposits of sandy and, in places, gravelly material. The Mattapex soils are on nearly level to moderately sloping uplands of the Coastal Plain.

Profile of Mattapex fine sandy loam (in a cultivated field about one-half mile north of Piscataway):

Ap—0 to 10 inches, brown or dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; soft, friable, slightly sticky but nonplastic; roots plentiful; very strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

A2—10 to 13 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, coarse, granular structure; slightly hard, friable, nonsticky and nonplastic; many fine roots; very strongly acid; clear, smooth boundary. 3 to 5 inches thick.

B21t—13 to 30 inches, yellowish-brown (10YR 5/4) light silty clay loam; moderate, medium, blocky structure; hard, friable to firm, sticky and slightly plastic; few

roots; almost continuous, dark yellowish-brown (10YR 4/4) clay coats; very strongly acid; abrupt, smooth boundary. 15 to 25 inches thick.

IIB22t—30 to 36 inches, strong-brown (7.5YR 5/6) fine sandy clay loam; few, medium, distinct mottles of light gray (2.5Y 7/2) and common, medium, faint mottles of yellowish red (5YR 4/8) and brownish yellow (10YR 6/6); very weak, thin, platy and weak, medium, subangular blocky structure; hard, firm, sticky and plastic; some patchy clay coats; very strongly acid; clear, smooth boundary. 0 to 9 inches thick.

IIC—36 to 48 inches +, brownish-yellow (10YR 6/6) light fine sandy loam; common, coarse, distinct mottles of light gray (2.5Y 7/2) and dark yellowish brown (10YR 4/4); stratified, becoming coarser and sandier with increasing depth; includes very thin strata of clay or fine silt; very friable, nonsticky and nonplastic; strongly acid.

In Prince Georges County, the A horizon of Mattapex soils is silt loam or fine sandy loam. The B21t horizon developed in the silty mantle and ranges from heavy silt loam to silty clay loam. In many areas a B22t horizon also has developed in this silty mantle. In places a IIBt horizon has developed in nonconforming, coarser material and has sandy clay loam or heavy sandy loam texture. The C horizon is generally of nonconforming material. It ranges from loamy sand to heavy sandy loam or light sandy clay loam in texture and, in places, contains a considerable amount of fine, rounded gravel. The solum ranges from about 30 to more than 40 inches in thickness.

In wooded areas the A1 horizon is thin and dark, but there is a somewhat thicker A2 horizon. Profiles range from dominantly brown, like the one described for the series, to a distinctly yellower color. The B2t horizon frequently is light olive brown and has a hue of 10YR or 2.5Y. In the Bt horizon, value ranges from 4 to 6 and chroma from 4 to 8, but chroma is always less than 6 in some part of this horizon. Mottles with chroma of 2 or less always occur in the upper 20 inches of the Bt horizon. In places the lower few inches of the Bt horizon is firm, but in most places this horizon is more uniformly friable.

The Mattapex soils are on the same kinds of material as the well-drained Matapeake soils and the poorly drained Othello soils. The Mattapex are not so thick as the Butlertown soils and are underlain by older, sandier materials. The Mattapex soils are more silty than the coarser textured Woodstown soils or the finer textured Keyport soils.

Mattapex soils are suited to all crops grown in the county, but slope, erosion hazard, and to some degree, wetness and impeded drainage limit use. Planting dates may be delayed in spring, and some frost heaving may occur in winter when the soils are wet. Seasonal wetness limits the Mattapex soils for use in community development.

Mattapex fine sandy loam, 0 to 2 percent slopes (MtA).—This is the soil described for the Mattapex series. It is moderately well drained but is suitable for most crops after drainage is improved. Drainage can be improved by using open ditches or tile. The sandy surface layer is easily cultivated. Under good management, this soil produces favorable yields. (Capability unit IIw–5; drainage group 2–A; irrigation group 9; and woodland group 11)

Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded (MtB2).—Except that surface water drains away more readily, this soil is like Mattapex fine sandy loam, 0 to 2 percent slopes. Some areas are uneroded, and a few are severely eroded. Included in mapping were a few places where shallow gullies have formed.

Drainage may be needed for only a few crops on this moderately well drained soil, but protection by graded rows or alternate graded strips of row crops and close-growing crops is needed for safe regular cultivation. (Capability unit IIe–36; drainage group 2–A; irrigation group 9; and woodland group 11)

Mattapex silt loam, 0 to 2 percent slopes (MuA).—This nearly level soil is typical of Mattapex soils that occur in areas that have a silt loam surface layer. The surface soil, when dry, feels soft and floury, but it contains some fine gritty material in places.

Impeded drainage limits use of this moderately well drained soil for some crops. Planting is usually delayed in spring, and the soil is difficult to work when it is wet. Open ditches are needed to improve drainage. Tile may be used to intercept seepage and to drain wet spots. (Capability unit IIw–1; drainage group 2–A; irrigation group 13; and woodland group 11)

Mattapex silt loam, 2 to 5 percent slopes, moderately eroded (MuB2).—The surface layer of this silty soil generally feels soft and floury when it is dry, but in some places it contains coarse material and feels slightly gritty. Included in mapping were a few uneroded and severely eroded places. Shallow gullies have formed in some places, and a few small areas are somewhat steeper than 5 percent.

Controlling erosion is the most important problem of management on this soil, but drainage probably is needed if some crops are grown. Seepage or wet spots can be drained with tile, and excess runoff can be controlled by farming in graded strips. All natural waterways should be kept in sod. This soil holds a good supply of moisture available for plants. (Capability unit IIe–16; drainage group 2–A; irrigation group 13; and woodland group 11)

Mattapex-Urban land complex, 0 to 5 percent slopes (MvB).—This complex consists of areas of Mattapex soils and disturbed land that is mainly of Mattapex soil material. These areas are used for community developments. About 20 percent of the areas mapped as this complex consists of typical Mattapex soils that have a fine sandy loam or silt loam surface layer. About 50 percent consists of original Mattapex soils that have been covered with as much as 18 inches of soil material, or has had as much as two-thirds of the original soil profile removed. The rest consists of Mattapex soils that have been covered to a depth of 18 inches or more or have had nearly all their profile cut away. The fill material has variable texture. (Drainage group 2–A; capability unit, irrigation group, and woodland group not assigned)

Mixed Alluvial Land

Mixed alluvial land is a miscellaneous land type that occurs on flood plains and consists of soil materials ranging from sand to clay. These materials have been washed from many different kinds of soils on uplands. At many sites the soil could be placed in an established soil series, but the soil characteristics change so rapidly within short distances that it is impractical to map soils of a specified texture.

Mixed alluvial land (Mw).—This land type consists of deposits on flood plains that range from sand to clay. Most areas are poorly drained. They are wet during wet periods and moderately wet in drier periods. In most areas this land is likely to be flooded frequently. Fairly large areas contain a significant amount of glauconite, or greensand.

Generally, the land is not suited to cultivated crops, but pasture and some hay crops can be grown if drainage and floods are reasonably controlled. Natural fertility varies a great deal. (Capability unit VIw–1; drainage group 12; woodland group 2; irrigation group not assigned)

Monmouth Series

The Monmouth series consists of deep, well-drained soils that developed in old deposits of clayey and sandy materials that contain a fairly large amount of greensand. The Monmouth soils are on nearly level to rolling or strongly sloping uplands, mainly in the central part of the county.

Profile of Monmouth fine sandy loam (in a woodland of oak and poplar on Church Road, about six-tenths of a mile north of St. Barnabas Church, near Leeland):

A1—0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; soft, loose, nonsticky and nonplastic; roots abundant; strongly acid; clear, smooth boundary. 1 to 2 inches thick.

A2—1 to 7 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, medium, granular structure; soft, very friable, nonsticky and nonplastic; roots plentiful; strongly acid; clear, wavy boundary. 5 to 8 inches thick.

B1—7 to 11 inches, olive-brown (2.5Y 4/4) sandy clay loam; moderate, coarse, subangular blocky structure; hard, friable to firm, slightly sticky and moderately plastic; roots common; strongly acid; clear, wavy boundary. 3 to 6 inches thick.

B21t—11 to 19 inches, olive-brown (2.5Y 4/4) sandy clay; strong, coarse, blocky and subangular blocky structure; very hard, very firm, very sticky and plastic; few roots; distinct, almost continuous olive-gray (5Y 4/2) clay coatings; fine, strong-brown (7.5YR 5/8), very soft to moderately hard concretions; very strongly acid; gradual, smooth boundary. 8 to 12 inches thick.

B22t—19 to 33 inches, olive-brown (2.5Y 4/4) sandy clay; moderate, coarse, blocky and subangular blocky structure; hard, firm, sticky and plastic; few roots in upper part; thin but distinct, almost continuous clay coatings; very strongly acid; gradual, smooth boundary. 12 to 16 inches thick.

B23t—33 to 48 inches, olive-brown (2.5Y 4/4) light sandy clay; weak, very coarse, blocky structure; hard, friable to firm, sticky and slightly plastic; prominent but discontinuous accumulations of olive-gray (5Y 4/2) clay; very strongly acid; gradual, irregular boundary. 10 to 20 inches thick.

C—48 to 60 inches +, (5Y 4/3) sandy clay loam to light sandy clay; massive; slightly hard, friable, slightly sticky and slightly plastic; tends to slake and become loose and less sticky when air dried; very strongly acid.

The plow layer of Monmouth soils generally is grayish brown (2.5Y 5/2) or olive gray (5Y 5/2 or 4/2). In severely eroded areas this layer ranges from heavy loam to clay loam in texture and from light olive brown (2.5Y 5/4) to olive (5Y 4/4) or olive brown (2.5Y 4/4) in color. The B1 horizon may be very thin or lacking. The B2 horizon generally is sandy clay or fine sandy clay, but in places it is heavy sandy clay loam, heavy clay loam, or clay. The chroma and value in the B horizon most commonly are 3, but they may be 4 where the horizon has a hue of 2.5Y. The B horizon most commonly has a hue of 2.5Y, but hue includes 5Y if a B1 horizon is present, and it grades toward 5GY in the B2 horizon. A rubbed smear of the B2 material is greener than the surface or the interior of aggregates. A rubbed smear of the C horizon is also more green, though this horizon is dark olive gray (5Y 3/2) to black (5Y 2/2). The C horizon ranges from heavy sandy loam to sandy clay in texture.

The Monmouth soils are on the same kinds of material as the moderately well drained Donlonton soils and the poorly drained Colemantown soils. The Monmouth soils are somewhat similar to Collington soils, which are less olive in color, less sticky, and developed on materials that have a lower content of greensand. They are also similar to the Howell soils, which are brighter colored, more silty, and developed in materials containing little or no greensand.

The Monmouth soils are of only moderate extent in Prince Georges County. They are productive and locally are important for farming, as well as for community development. The native vegetation is mixed upland hardwoods, mainly oak.

Monmouth clay loam, 5 to 10 percent slopes, severely eroded (MxC3).—This soil has lost most of the original sandy surface layer through erosion, and its surface layer now is clay loam. This layer, particularly when worked or plowed, is olive colored, firm, and sticky. It generally is in poor tilth. In a few places, the surface layer is sandy clay or sandy clay loam. Complex conservation practices that are intensively applied are needed to check excessive soil loss. (Capability unit IVe–3; irrigation group 14; woodland group 13; drainage group not assigned)

Monmouth clay loam, 10 to 30 percent slopes, severely eroded (MxD3).—This soil is so susceptible to erosion that it is not suited to cultivated crops, even though conservation practices are used. A protective cover of plants is needed at all times, but under good management, some areas may provide grazing. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Monmouth fine sandy loam, 0 to 2 percent slopes (MyA).—This is the soil described for the Monmouth series. It is suitable for most uses and has few, if any, restrictions. (Capability unit I–28; irrigation group 5; woodland group 7; drainage group not assigned)

Monmouth fine sandy loam, 2 to 5 percent slopes, moderately eroded (MyB2).—This soil is the most extensive Monmouth soil in Prince Georges County and the most important one in farming. Because erosion is a hazard, moderate conservation practices are needed for regular cultivation. Included in mapping were a few small areas that have a somewhat silty surface layer and some small areas where the sand is coarser throughout the profile than it is in the soil described for the series. (Capability unit IIe–28; irrigation group 5; woodland group 7; drainage group not assigned)

Monmouth fine sandy loam, 5 to 10 percent slopes, moderately eroded (MyC2).—On this sloping, readily eroded soil, special conservation measures that are intensively applied are needed for safe cultivation. In a few small areas, this soil is somewhat more silty or more sandy than the typical Monmouth soils. (Capability unit IIIe–28; irrigation group 5; woodland group 8; drainage group not assigned)

Monmouth fine sandy loam, 10 to 15 percent slopes, moderately eroded (MyD2).—Even where special conservation measures are intensely applied, this soil is suitable for only occasional cultivation. A clean-tilled crop can be produced about 1 year in 5 if conservation practices and good management are used. Included in mapping were some small areas that have a thicker and sandier surface layer than the typical Monmouth soils. (Capability unit IVe–5; irrigation group 5; woodland group 8; drainage group not assigned)

Muirkirk Series

The Muirkirk series consists of deep, well-drained to somewhat excessively drained soils that have a very thick, sandy surface layer and a red clay subsoil. These soils developed in a fairly thin mantle of sand underlain by thick deposits of very old clay. The Muirkirk soils are on nearly level to sloping uplands of the Coastal Plain, mainly in a general area between Bladensburg and Laurel.

Profile of Muirkirk loamy sand (in an idle field one-tenth mile south of Telegraph Road and about one-half mile west of Beltsville Airport Road):

Ap—0 to 8 inches, olive-brown (2.5Y 4/4) loamy sand; weak, fine, granular structure; loose; medium acid to slightly acid (limed); abrupt, smooth boundary. 8 to 10 inches thick.

A2—8 to 18 inches, yellowish-brown (10YR 5/4) loamy sand; very weak, fine, granular structure to single grain; very friable, nonsticky and nonplastic; medium acid to strongly acid; gradual, smooth boundary. 8 to 10 inches thick.

A3—18 to 23 inches, yellowish-brown (10YR 5/4) loamy sand; compound structure; very weak, medium, subangular blocky and single grain; slightly brittle but easily crushed when moist, nonsticky and nonplastic; irregular pockets of B1 material in lower part; medium acid to strongly acid; gradual, irregular boundary. 3 to 8 inches thick.

B1—23 to 28 inches, strong-brown (7.5YR 5/6) heavy loamy sand; very weak, medium, subangular blocky structure; slightly brittle but easily crushed when moist, nonsticky and nonplastic; irregular pockets of A3 material in upper part; strongly acid; abrupt, irregular boundary. 3 to 8 inches thick.

B21t—28 to 36 inches, red (2.5YR 4/8) sandy loam; weak, medium, blocky structure; slightly hard, friable, slightly sticky and slightly plastic; faint clay coats; irregular pockets of B1 material in upper part, and fragments of ferruginous sandstone or ironstone (Cirm horizon) in lower part; strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

IIB22t—36 to 60 inches +, red (2.5YR 4/6 to 10R 4/6) clay; strong, fine and medium, blocky structure; very hard, firm, sticky and plastic; prominent yellowish-red (5YR 4/6) clay coats that become thinner as depth increases; in lower part irregular pockets of reddish-yellow (5YR 6/6) parent material consisting of massive clay; very strongly acid.

In Prince Georges County, the A horizon is loamy sand more than 20 inches thick. The B1 horizon is also loamy sand, but the B21t horizon is sandy loam or light sandy clay loam. The B21t horizon is transitional between the coarse-textured horizon above and the fine-textured horizon below. Clay makes up the IIB22t horizon in all places. The IIB22t horizon grades gradually or abruptly into a IIC horizon of massive, red or particolored clay.

The A horizon has a hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4. The lowest value and chroma are in the A1 horizon. The A3 and B1 horizons are transitional and are very thin or absent. The B21t and IIB22t horizons have a hue of 2.5YR or 10R, a value of 4 or 5, and chroma that ranges from 6 to 8. The IIC horizon, if present, is red or a mixture of many colors. The solum ranges from about 40 to more than 60 inches in thickness.

The Muirkirk soils are on the same or similar kinds of material as the moderately well drained Matawan soils. The surface layer of the Muirkirk soils resembles that of the Evesboro and Galestown soils, and the subsoil is like that of the Christiana soils. The Muirkirk soils occur in the same general area as the Sunnyside soils and near a considerable acreage of mixed sandy, silty, and clayey soil materials mapped as miscellaneous land types.

The Muirkirk soils are not very extensive in the county and are mostly in areas of residential expansion. The native vegetation consists of scrub hardwoods and a considerable amount of Virginia pine.

Muirkirk loamy sand, 0 to 5 percent slopes, moderately eroded (MzB2).—This is the soil described for the Muirkirk series. Its chief limitations are the hazard of erosion and the sandiness of the thick surface layer. A few spots are severely eroded. (Capability unit IIs–5; irrigation group 2; woodland group 7; drainage group not assigned)

Muirkirk loamy sand, 5 to 10 percent slopes, moderately eroded (MzC2).—Because this soil is gently sloping to sloping the erosion hazard is more important than sandiness and is the primary problem of management. A few small areas are severely eroded. (Capability unit IIIe–5; irrigation group 2; woodland group 8; drainage group not assigned)

Ochlockonee Series

The Ochlockonee series consists of deep, well-drained soils that are normally on flood plains or first bottoms of streams, but in Prince Georges County these soils occur only in upland depressions, at the foot of slopes, and around the head of some drains. They are on the Coastal Plain. The Ochlockonee soils consist of recently deposited materials that washed from silty or sandy uplands. They are nearly level to moderately sloping.

Profile of Ochlockonee silt loam, local alluvium (in a wooded area about 2 miles north of T.B.):

A1—0 to 20 inches, dark grayish-brown (2.5Y 4/2) silt loam; weak, fine, granular structure; slightly hard, friable, slightly sticky but nonplastic; roots plentiful; medium acid to strongly acid; clear, smooth boundary. 18 to 24 inches thick.

C1—20 to 45 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; roots common in upper part; strongly acid; abrupt, smooth boundary. 20 to 30 inches thick.

IIC2—45 to 60 inches +, yellowish-brown (10YR 5/6) fine sandy clay loam; common, medium, faint mottles of light brownish gray (2.5Y 6/2); massive; hard, friable to firm, plastic and slightly sticky; very strongly acid and extremely acid.

The texture of the A1 and the C1 horizon is sandy loam or silt loam that is fairly uniform above the nonconforming IIC horizon, but in some places the surface is covered by an inch or more of local overwash that has a different texture. In most places the IIC2 horizon ranges from sand or sandy loam to sandy clay loam, and in places it contains a considerable amount of fine, smooth gravel.

Because additional soil material is deposited continually, the A1 horizon is thick in most places and in some places is as much as 30 inches thick. This horizon is generally dark grayish brown or brown. The C1 horizon ranges from brown to yellowish brown, but color may be variegated in stratified horizons. The IIC2 horizon is more variable in color than the C1 horizon, but generally the color does not indicate wetness. Some grayish colors may occur at a depth between 20 to 40 inches, but there are no neutral hues and no evidence of seasonal saturation. In some places a IIAb horizon replaces the IIC horizon where local alluvium has buried an older soil profile.

The well drained Ochlockonee soils are on the same general kinds of material as the moderately well drained Iuka soils, the poorly drained Bibb soils, and the very poorly drained Johnston soils. The Ochlockonee soils are

similar to the Comus soils, which consist chiefly of fine material that washed from areas of weathered acid crystalline rocks and commonly contains much finely divided mica.

The Ochlockonee soils are not extensive in Prince Georges County. They occur in very small, widely distributed areas that generally have good stands of mixed hardwoods.

Ochlockonee sandy loam, local alluvium, 0 to 2 percent slopes (OcA).—This soil is generally on the fairly flat bottoms of depressions in the uplands. The sandy loam extends from the surface of this soil to a depth of about 4 feet and is easy to work. This soil has practically no limitations to use. Included in mapping were some gravelly spots. (Capability unit I–6; irrigation group 10A; woodland group 4; drainage group not assigned)

Ochlockonee sandy loam, local alluvium, 2 to 5 percent slopes (OcB).—This soil occurs along the bottom of foot slopes, around the head of drainageways, and on the rim of depressions. Some areas are slightly gravelly. (Capability unit IIe–6; irrigation group 10A; woodland group 4; drainage group not assigned)

Ochlockonee sandy loam, local alluvium, 5 to 10 percent slopes (OcC).—This gently sloping to sloping soil is susceptible to erosion and requires fairly intensive practices of conservation if it is cultivated regularly. Included in mapping were a few gravelly areas and a few areas that have slopes of more than 10 percent. (Capability unit IIIe–6; irrigation group 10A; woodland group 4; drainage group not assigned)

Ochlockonee silt loam, local alluvium, 0 to 2 percent slopes (OhA).—This soil is the one described as typical of the Ochlockonee series in Prince Georges County. It is on the bottoms of depressions in the uplands and in other nearly level areas. To a depth of about 4 feet, the soil material is silt loam that feels somewhat floury. Generally, this soil is not so easy to work as the sandier Ochlockonee soils, but it is somewhat more productive. (Capability unit I–6; irrigation group 10; woodland group 4; drainage group not assigned)

Ochlockonee silt loam, local alluvium, 2 to 5 percent slopes (OhB).—On this gently sloping soil, there is a moderate hazard of erosion. Included in mapping were some gravelly spots and small areas that have slopes of more than 5 percent. (Capability unit IIe–6; irrigation group 10; woodland group 4; drainage group not assigned)

Ochlockonee, local alluvium-Urban land complex (Ok).—This complex consists of nearly level to sloping Ochlockonee soils and disturbed land that is mainly of Ochlockonee soil material. These areas are used for community developments. These soils have been rearranged into complex patterns on the landscape. About 25 percent of each area mapped consists of Ochlockonee soils that have a sandy loam or silt loam surface layer. About 55 percent of each area has been covered with as much as 18 inches of fill material or has had as much as about 24 inches of the soil profile removed. The rest consists of Ochlockonee soils that have been covered to a depth of 18 inches or more or places where most of the Ochlockonee soil profile has been cut away. The fill material consists of sand, silt, or clay in almost any proportion. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Othello Series

The Othello series consists of deep, poorly drained soils that have a gray, highly silty subsoil through which water moves slowly. These soils have developed in a thin mantle of silt over older beds of sandy and, in places, gravelly materials. The silt probably was deposited by wind. The Othello soils are on nearly level to gently sloping uplands of the Coastal Plain.

Profile of Othello fine sandy loam (in a wooded area about 1 mile southeast of White Landing):

A1—0 to 3 inches, dark grayish-brown (2.5Y 4/2) fine sandy loam; weak, fine, granular structure; soft, friable, slightly sticky but nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 2 to 4 inches thick.

A2—3 to 12 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; few, medium, prominent mottles of strong brown (7.5YR 5/8); weak, fine, granular structure; slightly hard, friable, slightly sticky but nonplastic; roots fairly common; old root channels filled with material from A1 horizon; very strongly acid; abrupt, smooth boundary. 8 to 10 inches thick.

B21tg—12 to 24 inches, light brownish-gray (2.5Y 6/2) heavy silt loam; common, medium, prominent mottles of strong brown (7.5YR 5/8); weak, medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few roots; thin clay films; very strongly acid and extremely acid; gradual, smooth boundary. 8 to 12 inches thick.

B22tg—24 to 40 inches, light olive-gray (5Y 6/2) light silty clay loam, slightly variegated with pale olive (5Y 6/3); common, medium, prominent mottles of yellowish brown (10YR 5/8); hard, friable to firm, sticky and plastic; thin clay films; very strongly acid and extremely acid; abrupt, smooth boundary. 15 to 20 inches thick.

IIB23tg—40 to 48 inches, light olive-gray (5Y 6/2) fine sandy clay loam; common, medium, prominent mottles of yellowish brown (10YR 5/8); hard, friable to firm, slightly sticky and slightly plastic; thin clay films in pores; very strongly acid and extremely acid; clear to abrupt, smooth boundary. 0 to 8 inches thick.

IICg—48 to 60 inches +, light olive-gray (5Y 6/2) fine sandy loam; common, medium, distinct mottles of light yellowish brown (2.5Y 6/4) and abundant, medium, prominent mottles of yellowish brown (10YR 5/8); massive; friable, slightly sticky but nonplastic; extremely acid.

In Prince Georges County, the A horizon is silt loam or fine sandy loam. The B21tg and B22tg horizons range from heavy silt loam to silty clay loam, but the nonconforming IIB23tg horizon, if present, has a higher content of sand and is sandy clay loam or heavy sandy loam. The IICg horizon is sandy and contains a considerable amount of fine gravel in places. The solum generally ranges from 20 to 36 inches in thickness, though the profile described is somewhat thicker, mainly because it has a IIB23tg horizon, and that horizon is missing in most places.

In cultivated areas the plow layer ranges from gray or dark gray to dark grayish brown. Throughout the profile, the hue of the matrix ranges from 2.5Y to neutral, value ranges from 4 to 6, and chroma ranges from 0 to 3. Most mottling has a hue of 10YR or 7.5YR, a value of 5 or 6, and chroma that ranges from 4 to 8.

The Othello soils are a light-grayish color when they are moist, but when dry, they are white and have a grayish surface.

The Othello soils are on the same kinds of material as the well drained Matapeake and the moderately well drained Mattapex soils. They are similar to the Leonardtown soils, which developed in thicker deposits of silt and have a dense, tough, hard subsoil that is very slowly permeable. The Othello soils are more silty than the coarser textured Fallsington soils or the finer textured Elkton soils.

The Othello soils are not extensive in Prince Georges County but are important in farming. Artificially drained areas are suited to most crops common in the area, but probably not to tobacco. Because they are wet and their water table is seasonally high, these soils are poorly suited to residential or industrial development. The native vegetation is wetland hardwoods and, in many places, some pond pine.

Othello fine sandy loam (Ol).—This soil has a profile like the one described for the Othello series. Most areas are nearly level, but a few are gently sloping.

Wetness is the most important problem of management, but adequately drained areas are suitable for corn, soybeans, and similar crops and to some hay and pasture plants. This soil has severe limitations for some uses necessary in community development. (Capability unit IIIw–6; drainage group 8–1A; irrigation group 9; woodland group 10)

Othello silt loam (Ot).—This soil is typical of Othello soils that occur in areas having a silt loam surface layer. In places subsoil material is in the surface layer where plowing has been deep. Most of the acreage is nearly level, but some areas are gently sloping. Included in mapping were local gravelly areas and places where the surface soil has little or no mottling and is browner than that of the typical Othello soils. In some places shallow gullies have formed.

Wetness is the most important problem of management, but adequately drained areas are suitable for corn, soybeans, hay, and pasture. This soil has severe limitations to many uses in community development. (Capability unit IIIw–7; drainage group 8–1A; irrigation group 13; woodland group 10)

Plummer Series

The Plummer series consists of deep, poorly drained, sandy soils on the Coastal Plain. These soils developed in thick beds of sandy materials that are saturated with water much of the time. The Plummer soils are in sandy depressions of the uplands, mainly in the northern part of the county. In Prince Georges County, Plummer soils are mapped only in an undifferentiated group with Rutlege soils.

Profile of Plummer loamy sand (in a wooded area about 3 miles west of Bowie):

A1—0 to 4 inches, dark-gray (10YR 4/1) loamy sand; very weak, medium, granular structure; loose; roots abundant; very strongly acid; clear, smooth boundary. 4 to 6 inches thick.

C1—4 to 11 inches, light brownish-gray (2.5Y 6/2) light loamy sand; single grain; loose; roots common to plentiful; very strongly acid to extremely acid; gradual, irregular boundary. 5 to 12 inches thick.

C2g—11 to 60 inches +, variable light-gray to white (5Y 7/1 to 8/1) fine sand; irregular streaks and splotches of grayish brown (2.5Y 5/2) and pale brown (10YR 6/3); single grain; loose; tends to shift or flow in lower part; extremely acid.

The A horizon of Plummer soils is loamy sand. The C horizon generally ranges from sand to light loamy sand, but in some places a IICg horizon occurs that is finer textured at a depth of 4 to 6 feet.

In most places the plow layer is light gray, and the surface appears almost white when it dries after rains. Hue ranges from 10YR to neutral, and value is high in the matrix of all horizons except the A1. Chroma is 2 or less in the matrix of all horizons. Mottles or streaks in the C horizon have a higher chroma than those in the profile described.

The Plummer are on the same kinds of sandy material as the somewhat excessively drained and excessively drained Galestown and Evesboro soils, the moderately well drained Klej soils, and the very poorly drained Rutlege soils. In color and drainage, the Plummer soils are similar to the Fallsington soils, which are less sandy and have a subsoil containing a considerable amount of clay.

The Plummer soils occupy only a small acreage in Prince Georges County. They occur in small, widely scattered areas. If these soils are drained, they are generally easy to work and manage and can be used for farming, particularly for truck crops or home gardens. A large amount of fertilizer is needed for favorable yields. The native vegetation consists mainly of wetland hardwoods.

Plummer and Rutlege loamy sands (Pr).—These two nearly level soils occur together in such an intricate pattern that, for the purpose of this survey, it is not practical to map them separately. In many places the more extensive Plummer soil occupies the larger part of upland depressions, and the Rutlege soil is in the smaller, lower, wetter part. The Rutlege soil has the darker, thicker surface layer. Each soil may occur separately in small areas. A profile of Rutlege loamy sand is described for the Rutlege series. Included in mapping were a few areas that are gently sloping.

Drained areas of these soils are suited to corn, soybeans, blueberries, and some truck crops. If outlets are adequate, tile drains generally function well in these soils. (Capability unit IVw–6; drainage group 9–1; irrigation group 1; woodland group 10)

Rumford Series

The Rumford series consists of deep, well-drained soils that developed in sandy materials containing some clay but little silt. These soils are on nearly level to strongly sloping uplands of the Coastal Plain. The Rumford soils are fairly well distributed in the county but are of only moderate extent.

Profile of Rumford loamy sand (in a cultivated field on Cherry Hill Road, south of the Montgomery County line):

Ap—0 to 10 inches, grayish-brown (10YR 5/2) loamy sand; very weak, fine, granular structure to single grain; loose and very friable; roots plentiful; very strongly acid; clear, smooth boundary. 9 to 12 inches thick.

A2—10 to 17 inches, light yellowish-brown (2.5Y 6/4) loamy sand; single grain; loose and very friable; roots common; very strongly acid; clear, smooth boundary. 5 to 10 inches thick.

B1—17 to 23 inches, strong-brown (7.5YR 5/6) light sandy loam; very weak, medium, subangular blocky structure; very friable, slightly sticky but nonplastic; roots common; very strongly acid; gradual, smooth boundary. 3 to 8 inches thick.

B2t—23 to 31 inches, yellowish-red (5YR 5/6) heavy sandy loam; weak to moderate, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few roots; thin, discontinuous but clearly evident clay coatings; very strongly acid; clear, smooth boundary. 5 to 10 inches thick.

C1—31 to 42 inches, yellowish-brown (10YR 5/6) loamy sand; single grain; loose to very friable; very few roots;

extremely acid; gradual, smooth boundary. 10 to 15 inches thick.

C2—42 to 54 inches +, pale-brown (10YR 6/3) light loamy sand; single grain; loose; extremely acid.

The A horizon of Rumford soils is loamy sand. The content of clay in the B2t horizon ranges from about 10 to 18 percent, but this horizon contains little silt. The amount of fine material decreases with depth, and the C horizon is coarser textured than the B2t. In places a small amount of fine, smooth pebbles occurs in the profile. The solum ranges from about 24 to 40 inches in thickness.

In undisturbed areas the Rumford soils have a thin, dark grayish-brown A1 horizon and a somewhat thicker A2 horizon. The A2 horizon is light yellowish brown or pale brown. The B1 horizon is transitional both in color and texture. In most places the B2t horizon has a hue of 5YR that grades toward 7.5YR. Value in the B2t horizon is 5 or 6, and chroma ranges from 6 to 8. The C horizon is less red and generally is paler than the B horizon.

The Rumford soils are somewhat similar to the Westphalia soils but have a redder subsoil and do not contain so much fine and very fine sand. The Rumford soils have a somewhat finer textured subsoil than the Galestown soils. In color and drainage, the Rumford soils are similar to the Sassafras soils, which have a distinctly finer textured subsoil.

Rumford loamy sand, 0 to 2 percent slopes (RdA).—This soil has a profile like the soil described for the series. The surface layer or plow layer of this nearly level soil contains a considerable amount of medium and coarse sand.

Use of this soil is somewhat limited by sandiness and a low moisture-holding capacity. In most places erosion is not a hazard. This soil is suited to general crops and to deep-rooted crops. It produces tobacco and truck crops of very high quality. Special practices are needed that maintain fertility, and crops are benefited by irrigation in dry periods. (Capability unit IIs–4; irrigation group 3; woodland group 7; drainage group not assigned)

Rumford loamy sand, 2 to 5 percent slopes, moderately eroded (RdB2).—Except for steeper slopes, this soil is like Rumford loamy sand, 0 to 2 percent slopes. The risk of erosion is moderate. The surface layer contains a considerable amount of medium and coarse sand. Included in mapping were some severely eroded areas where the reddish subsoil material is mixed with the original surface soil. Also included were a few areas that have finer sand in the surface layer and a yellower subsoil than the soil described as typical for the Rumford series. In some places a few shallow gullies have formed.

This soil is sandy. Productivity is limited because only small amounts of moisture and plant nutrients are available to plants. Tobacco and truck crops of very high quality can be produced if practices are used to conserve moisture and fertility and if irrigation is used as needed. Also needed are conservation practices. (Capability unit IIs–4; irrigation group 3; woodland group 7; drainage group not assigned)

Rumford loamy sand, 5 to 10 percent slopes, moderately eroded (RdC2).—Because this soil is on hillsides, it is susceptible to erosion. Medium and coarse sand are dominant in the surface layer. Some of the original surface soil has been lost through erosion, but the subsoil material has been exposed only in a few places where shallow gullies have formed. Included in mapping were some uneroded areas. Also included were a few areas where the sand in the surface layer is finer than normal and where the subsoil is yellower than that in the profile described for the Rumford series.

This soil is suited to general crops and to deep-rooted crops, though erosion is likely and only small amounts of moisture and plant nutrients are available to plants. The hazard of erosion is fairly high. This soil is low in available moisture and in plant nutrients. Tobacco and truck crops of very high quality can be grown. Crop rotation, winter cover crops, and contour farming are needed to conserve soil and water. Supplemental irrigation should be available if truck crops, tobacco, and other crops of high value are grown. (Capability unit IIIe–33; irrigation group 3; woodland group 8; drainage group not assigned)

Rumford loamy sand, 5 to 10 percent slopes, severely eroded (RdC3).—The original thick surface layer and the subsurface layer of this soil have been almost entirely lost through erosion. The soil is shallow to the underlying sandy material, and the sandy surface layer contains much reddish subsoil material. Gullies have formed in some places.

This soil is suited only to an occasional cultivated crop. It generally produces tobacco of very high quality. Because the erosion hazard is high, all conservation measures that can be applied are needed. (Capability unit IVe–5; irrigation group 3; woodland group 13; drainage group not assigned)

Rumford loamy sand, 10 to 15 percent slopes, moderately eroded (RdD2).—This is the steepest mapping unit of Rumford loamy sand in the county. The surface layer is dominantly medium and coarse sand. Some of the original surface soil has been lost through erosion, but subsoil material has been exposed only in a few places where shallow gullies have formed. Included in mapping were some areas that are only slightly eroded.

This soil is suited to continued cultivation, provided the crop rotations are long and close-growing plants are grown most of the time. Good hay or pasture can be grown, but special care is required for preventing overgrazing. (Capability unit IVe–5; irrigation group 3; woodland group 8; drainage group not assigned)

Rumford-Evesboro loamy sands, 2 to 6 percent slopes (ReB).—This complex consists mainly of a Rumford loamy sand similar to the soil described for the Rumford series, but a small part is Evesboro loamy sand. In places, particularly on slight knolls and ridges where windblown sand has accumulated, the surface layer is much thicker than that of the typical Rumford soil. In places where the accumulation of sand is 3 feet or more thick, the soil profile is essentially the same as that described elsewhere in the report for the Evesboro series. The Evesboro soil makes up only a small part of the mapping unit, and there are areas where one kind of soil grades into the other. Included in mapping were a few severely eroded areas.

The soils of this complex are suited to general crops and to deep-rooted crops. They produce tobacco and truck crops of very high quality. The sandiness of the thick surface layer creates a greater problem of management than erosion, but the hazard of erosion, particularly by wind, is important. Because these soils have a low moisture-holding capacity, supplemental irrigation is generally desirable and may be essential during unusually dry periods. Low fertility is also a major problem.

(Capability unit IIs-4; irrigation group 3; woodland group 7; drainage group not assigned)

Rumford-Evesboro loamy sands, 6 to 12 percent slopes (ReC).—This complex is steeper than Rumford-Evesboro loamy sands, 2 to 6 percent slopes. Much of the original surface soil has been removed through erosion, and in many places material from the subsoil of the thinner Rumford soil has been mixed with the surface soil in plowing and cultivating. A freshly cultivated field has a spotted appearance. In areas of the deep Evesboro soil, where the subsoil material has not been turned up in plowing, the field is light colored, but it is distinctly brownish or reddish in areas where the subsoil material of the more shallow Rumford soil has been turned up or exposed. Included in mapping were some areas that are uneroded.

The soils of this complex are suited to most of the general farm crops and to deep-rooted crops. If management is good, yields are favorable. The tobacco produced is generally of very high quality. Ways to conserve soil and water are farming on the contour and keeping a cover of permanent plants on the soils much of the time. Supplemental irrigation should be available if truck crops, tobacco, and other crops of high value are grown. (Capability unit IIIe–33; irrigation group 3; woodland group 8; drainage group not assigned)

Rumford-Evesboro loamy sands, 12 to 20 percent slopes (ReD).—Except that it is moderately sloping to steep, this mapping unit is like Rumford-Evesboro loamy sands, 2 to 6 percent slopes. Much of the original surface soil has been removed through erosion, and in many places material from the subsoil of the Rumford soil has been mixed with the surface soil in plowing and cultivation. A freshly cultivated field has a spotted appearance. In areas of the deep Evesboro soil, where the subsoil material has not been turned up, the field is light colored, but it is distinctly brownish or reddish in areas where the subsoil material of the more shallow Rumford soil has been turned up or exposed. Included in mapping were some areas that are uneroded and a few places where shallow gullies have formed.

Adapted cultivated crops can be grown safely in a rotation lasting 5 years or more, if the soils are kept under a cover of protective plants most of the time, and if strong supporting conservation measures are used. (Capability unit IVe–5; irrigation group 3; woodland group 8; drainage group not assigned)

Rutlege Series

The Rutlege series consists of deep, very poorly drained, very sandy soils that have a thick, dark surface layer. These soils developed in thick beds of sandy materials that were saturated with water for long periods. The Rutlege soils occupy sandy upland depressions on the Coastal Plain, mostly in the northern part of the county. In Prince Georges County, Rutlege soils are mapped only in an undifferentiated group with Plummer soils.

Profile of Rutlege loamy sand (in a wooded area about 3 miles west of Bowie):

A1—0 to 12 inches, black (5Y 2/1) loamy sand, high in organic-matter content; very weak, medium, granular structure; loose to very friable; roots abundant; somewhat mucky on surface; very strongly acid and extremely acid; clear to abrupt, smooth boundary. 10 to 12 inches thick.

C1g—12 to 30 inches, gray (5Y 5/1) light loamy sand; single grain; loose; streaked, splotched, and mottled with pale yellow (2.5Y 8/4) and light yellowish brown 2.5Y 6/4); roots common in upper part, few in lower part; extremely acid; gradual, irregular boundary. 10 to 20 inches thick.

C2g—30 to 52 inches, light-gray (N 7/0) sand or fine sand; abundantly streaked and splotched with yellowish brown (10YR 5/4); single grain; loose; sand tends to shift or flow; extremely acid; abrupt, smooth boundary. 15 to 25 inches thick.

IIC3g—52 to 60 inches +, light-gray (5Y 7/1) heavy sandy loam; common, coarse, prominent mottles of yellowish brown (10YR 5/6); massive; friable, sticky and slightly plastic; extremely acid.

In drained and cultivated areas, the plow layer may be dark or very dark gray instead of black; white grains of sand show distinctly against the darker background. In places a dark or very dark gray A12 horizon occurs and extends to a depth of as much as 20 inches or more. The IIC3g horizon may not occur within a 6-foot depth. Where it does occur, it ranges from sandy loam to sandy clay. Its color is almost any shade of gray, and mottling is varicolored.

The Rutlege soils are on the same kinds of sandy material as the somewhat excessively drained to excessively drained Evesboro and Galestown soils, the moderately well drained Klej soils, and the poorly drained Plummer soils. In Prince Georges County, the Rutlege and the Plummer soils are so difficult to separate on the soil map that they are shown together. The Rutlege soils are similar to the Johnston and Hyde soils in color and drainage, but those soils contain more silt and clay and less sand.

The Rutlege soils are inextensive in the county and of little importance for farming. They occur only in small, rather widely scattered areas. If they are drained, these soils can be used for truck crops, corn, or soybeans, and they are especially suited to home gardens. The native vegetation is mainly wetland hardwoods and some pond pine.

Sandy Land

Sandy land is a miscellaneous land type that consists of sandy Coastal Plain sediments exposed mainly on the steep slopes along ravines and stream valleys. It is mostly in the southern part of the county, but some areas are in other parts. This land type is made up mostly of the same kind of sandy material that underlies the Evesboro, Galestown, Sassafras, Westphalia, and other soils in the county.

Sandy land, steep (SaE).—In some parts of this land type, the sand is mostly fine, and there is no gravelly material. In other parts there is a considerable amount of smooth, mostly fine gravel. Locally, there is some development in the subsoil and some accumulation of clay at a moderate depth.

A large acreage of this mapping unit has been severely eroded, but erosion affects present use very little. Large areas have reverted to trees, some are in brush, and others have never been cleared. This land is not well suited to any farm use. (Capability unit VIIs–1; woodland group 6; drainage group and irrigation group not assigned)

Sandy and Clayey Lands

Sandy and clayey lands occur mainly in the northern and western parts of the county. Their soil material consists primarily of very old deposits of clay in the upper part of the Coastal Plain sediments that have been covered by a mantle of various kinds of material. In fairly large areas, this mantle consists mostly of sand, but it contains some silt and clay and, in places, much fine, smooth gravel. In even larger areas, the material in the surface layer is mainly silty, or silty and sandy, but these areas are intricately mixed on the landscape.

The surface mantle has variable colors of gray through yellow and brown to almost red and ranges from less than an inch to several feet in thickness. The color and thickness of this mantle varies widely within short distances. The surface mantle abruptly overlies clay, to which it is not related in any way. In places the clay is a little sandy or silty. It is of almost any color or mixture of colors, including red, purplish red, gray, yellow, pink, and white. It is almost at the surface in places and is covered with sand and gravel or with more silty material only a few feet away. The clay is very plastic and sticky, but its most important characteristic probably is very poor stability. Cuts through this clay are very difficult to stabilize, as the clay frequently slides, slumps, or flows down the surface of the cut. The stability is even poorer in areas where the clay has been disturbed in land leveling, filling, or other operations.

The mixed soil materials of these lands have variable but normally low moisture-holding capacity. These lands contain only a small amount of plant nutrients and are not productive, even under good management. Suitability for crops varies with the texture and thickness of the surface layer. Use of these lands for farming is severely limited by the lack of available moisture and of plant nutrients and by slope and erosion. Some areas are cultivated, some have been stripped for mining clay, but most are idle, are wooded, or are used for community development.

The soil materials of these lands, especially where they have been disturbed, have poor stability, which limits them for most uses and even makes them dangerous for some uses. They may be squeezed out from under building foundations and allow the footings or basements to crack and settle. Occasionally, property is damaged and people are killed or injured when fills consisting of these materials collapse.

Sandy and clayey land, gently sloping (ScB).—This gently sloping land type has a dominantly sandy surface layer. Some areas are used for farming, but favorable yields normally cannot be expected. Control of erosion is needed for any kind of a cropping system, but the kind of practices needed depend upon condition of the particular field. (Capability unit IIIe–41; irrigation group 5; woodland group 14; drainage group not assigned)

Sandy and clayey land, sloping (ScC).—Because this land type has fairly strong slopes, the hazard of erosion is high. Determining the amount of erosion is difficult because the horizons, or layers, are not genetically related. The underlying clay may be at or near the surface or deep beneath the sandy material.

This land is suitable for only infrequent cropping. Close-growing crops or other protective vegetation are needed most of the time. (Capability unit IVe–5; irrigation group 5; woodland group 14; drainage group not assigned)

Sandy and clayey land, moderately steep (ScD).—This moderately steep land type is so erodible and so unstable that it is not suited to cultivated crops or to some other uses. Well-sodded areas can be used safely for pasture. The kinds of suitable plants range from grasses to trees, but the plants used should have a deep, extensive root system to help protect against erosion and against slipping and flowing. (Capability unit VIe–2; woodland group 14; drainage group and irrigation group not assigned)

Sassafras Series

The Sassafras series consists of deep, well-drained soils that developed in silty and clayey sand that is gravelly in places. These soils occur on nearly level to rolling or very steep uplands of the Coastal Plain. The Sassafras soils are extensive and are well distributed in the county.

Profile of Sassafras sandy loam (in a wooded area near the intersection of Old Chapel Road and State Route 197):

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; soft, loose, nonsticky and nonplastic; roots abundant; strongly acid; clear to abrupt, smooth boundary. 2 to 3 inches thick.

A2—2 to 10 inches, dark yellowish-brown (10YR 4/4) sandy loam; weak, medium, granular structure; soft to slightly hard, friable, slightly sticky but nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 8 to 12 inches thick.

B1—10 to 15 inches, brown or dark-brown (7.5YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; roots common; very strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

B21t—15 to 32 inches, brown or dark-brown (7.5YR 4/4) sandy clay loam; moderate to strong, medium, subangular blocky structure; hard, friable to firm, sticky and moderately plastic; few roots; faint to distinct clay coats on aggregates and on sides of old root channels; very strongly acid; gradual, smooth boundary. 12 to 20 inches thick.

B22t—32 to 40 inches, brown or dark-brown (7.5YR 4/4) sandy clay loam; weak to moderate, medium, subangular blocky structure; slightly hard, friable, slightly sticky and moderately plastic; very few roots; faint clay coats and some prominent, discontinuous accumulations of clay; very strongly acid; clear, smooth boundary. 8 to 12 inches thick.

C—40 to 48 inches +, strong-brown (7.5YR 5/6) heavy loamy sand; single grain; soft, very friable, nonsticky and nonplastic; irregular small pockets of material from horizon above in upper part; thin fragments of ferruginous sandstone (Cirm horizon); very strongly acid.

In Prince Georges County, the A horizon is gravelly loam, gravelly sandy loam, or sandy loam. The B horizon is loam, sandy clay loam, or heavy sandy loam, and its content of clay ranges from 18 to 35 percent. In most places the C horizon is loamy sand or light sandy loam. Smooth, cherty gravel generally less than 1 inch in diameter may occur in any part of the profile. In Prince Georges County, large areas of Sassafras soils are gravelly. The solum ranges from about 34 inches to nearly 50 inches in thickness.

In most cultivated areas the plow layer is grayish brown or dark grayish brown. The A2 horizon ranges from dark yellowish brown (10YR 4/4) to light yellowish brown (10YR 6/4). The Bt horizon generally has a hue of 10YR or 7.5YR, but in some places the hue grades toward 5YR. The value in the Bt horizon is 4 or 5, and chroma ranges from 4 to 6, or rarely to 8, but in some part of the Bt horizon the chroma is always less

than 6. In most places the C horizon has the same range in hue and value as the Bt horizon, but range may vary widely in chroma. Some soil profiles have reddish reticulate mottling in the C horizon. The mottling is not evidence of impeded aeration or drainage but of segregation and oxidation of iron.

The Sassafras soils are on the same kinds of material as the moderately well drained Woodstown soils and the poorly drained Fallsington soils, but the Woodstown and Fallsington soils are gravelly in fewer places. The Sassafras are similar to the Collington soils, which are commonly less gravelly, are more olive colored, and have a more sticky subsoil. The Sassafras soils are somewhat similar to the Sunnyside but are distinctly less red, particularly in the subsoil.

The Sassafras soils are extensive in many parts of the county and are important for farming. Also, they are well suited to residential and industrial development. The native vegetation is mixed upland hardwoods, mainly oak, but local areas have a considerable amount of Virginia pine and some loblolly pine.

Sassafras gravelly loam, 2 to 5 percent slopes, moderately eroded (SfB2).—This soil is more gravelly than the soil described for the series. Included in mapping were a few areas where the surface layer is a mixture of the original surface soil and material from the subsoil and a few areas where most of the surface layer consists of sticky, gravelly, subsoil material.

This soil is well suited to general crops and to deep-rooted crops. It produces favorable yields of tobacco. Crop rotations should include hay at least 1 year in 3 or 4. Contour strips are needed in all fields that have long slopes, and waterways should be kept in sod. This soil has few limitations to use for community development. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Sassafras gravelly loam, 5 to 10 percent slopes, moderately eroded (SfC2).—Except for steeper slopes, this soil is like Sassafras gravelly loam, 2 to 5 percent slopes, moderately eroded. Erosion has thinned the surface layer so much that plowing has mixed sticky subsoil material into the original loam surface layer. Included in mapping were many places where the subsoil is exposed and a few places where gullies have formed. The surface soil and subsoil contain a considerable amount of fine, smooth, cherty gravel. The underlying material commonly contains a large amount of gravel.

This soil is well suited to general crops and to deep-rooted crops. Favorable yields of tobacco are produced, and the tobacco may be of medium quality. Crop rotations, contour stripcropping, diversion terraces, and sodded waterways are needed to help check erosion. (Capability unit IIIe–4; irrigation group 13; woodland group 8; drainage group not assigned)

Sassafras gravelly loam, 10 to 15 percent slopes, moderately eroded (SfD2).—This soil occurs mostly in the southern part of the county. The surface layer is a mixture of the original surface soil and some sticky subsoil material. The surface layer and subsoil contain a considerable amount of gravel that may be fine and smooth or cherty. Commonly, a large amount of gravel is in the underlying material. A few shallow gullies have formed in some fields. Included in mapping were a few areas that are only slightly eroded.

This soil is well suited to general crops, but cultivation is marginal, even if management is good. Yields of truck crops and tobacco are favorable, but the quality of tobacco may be medium. This soil is well suited to hay and permanent pasture. Some conservation practices needed are rotating crops, cultivating on the contour, stripcropping with buffer strips, minimum tillage, terracing, and sodding the waterways. (Capability unit IVe–3; irrigation group 13; and woodland group 8; drainage group not assigned)

Sassafras gravelly sandy loam, 2 to 5 percent slopes, moderately eroded (SgB2).—This soil is more gravelly than the soil described for the Sassafras series. A moderate amount of smooth, rounded pebbles about 2 inches in diameter is in the surface layer and subsoil. The risk of erosion is moderate. In some places the soil is shallow to the underlying sand, and in other places the surface layer is a mixture of the original surface soil and sticky subsoil material. Included in mapping were a few places where shallow gullies have formed.

This soil is well suited to general crops and to deep-rooted crops. It produces tobacco of high quality. Among the ways of controlling erosion are rotating crops, planting winter cover crops, contour farming, installing diversion terraces, and sodding the waterways. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded (SgC2).—Except for steeper slopes, this soil is like Sassafras gravelly sandy loam, 2 to 5 percent slopes, moderately eroded. A moderate to fairly large amount of smooth, rounded pebbles as much as 2 inches in diameter occurs throughout the solum. Included in mapping were a few spots where the surface layer is a mixture of the original surface soil and some subsoil material. Also included were a few areas where shallow gullies have formed.

This soil is suited to general crops and to deep-rooted crops. Under good management, it produces tobacco of high quality. A good supply of moisture is held available for plants, but during long dry periods this soil may be somewhat droughty. Rotation of crops, contour strips, diversion terraces, and sodded waterways are practices that help to control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sassafras gravelly sandy loam, 5 to 10 percent slopes, severely eroded (SgC3).—This soil is shallower to the underlying material than Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded. Most of the original surface soil has been removed through erosion, and the surface layer now contains much sticky subsoil material and a large amount of gravel. In a few places some shallow gullies have formed. The subsoil contains a considerable amount of smooth, rounded pebbles, and the underlying material commonly contains a large amount. Included in mapping were areas where the soil contains glauconite, or greensand, and a few places where the surface layer is redder than normal and the subsoil is compacted.

This soil can be used for farming in long crop rotations that include only an occasional cultivated crop, or it can be used for hay and pasture. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded (SgD2).—This moderately steep

soil erodes readily if used in regular cultivation without protection. A moderate to fairly large amount of smooth, rounded pebbles occurs throughout the solum. Included in mapping were some areas where there are only a few fine pebbles but that contain a considerable amount of fine, silvery mica in the solum. In some places the surface layer contains some subsoil material, and in other places a few shallow gullies have formed.

This soil can be used for farming in long crop rotations that include only an occasional cultivated crop, or it can be used less intensively for hay and pasture. (Capability unit IVe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sassafras gravelly sandy loam, 10 to 15 percent slopes, severely eroded (SgD3).—This soil is somewhat similar to Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded, but it has been so severely damaged by erosion that it can no longer be safely cultivated. The surface material is hard when dry and in most places contains a layer of gravel. In places gullies are few or many, and some of them are deep. Included in mapping were some areas where there are only a few fine pebbles in the profile. Also included were a few areas that have many seeps or wet spots.

Permanent vegetation should be established on this soil. This soil can be used for hay, or for pasture if it is carefully grazed. Use for community development is severely limited. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Sassafras gravelly sandy loam, 15 to 30 percent slopes (SgE).—This steep soil contains a moderate to fairly large amount of smooth, rounded pebbles in the solum. Included in mapping were many areas where the fine pebbles are few. Also included were severely eroded areas where the surface layer is mostly subsoil material. Gullies, some of them deep, have formed in places. In a few places the surface layer consists of loose coarse sand, and some areas are somewhat steeper than 30 percent.

This soil is not suitable for cultivation, but if grasses or legumes are well established, it can be grazed or used for hay. Limitations to use for community development are severe. (Capability unit VIe–2; woodland group 9; drainage group and irrigation group not assigned)

Sassafras sandy loam, 0 to 2 percent slopes (ShA).—This is the soil described for the Sassafras series. In some places the soil profile contains some fine, smooth, cherty gravel. In a few places the surface layer contains a considerable amount of fine sand and silt.

This soil is well suited to most general crops and to deep-rooted crops. It has a good moisture-holding capacity and is easily worked. Under good management, this soil produces favorable yields of high-quality tobacco. Limitations to use for community development are few. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (ShB2).—Except for slopes, this soil is like Sassafras sandy loam, 0 to 2 percent slopes. The risk of erosion is moderate. Included in mapping were some areas where the soil is shallower than normal to the underlying sand and places where the surface layer contains some sticky subsoil material. Also included are some spots that have a considerable amount of gravel in their surface layer and a few places that have some glauconite, or greensand, in their profile. A few shallow gullies have formed in some fields.

This soil is well suited to most general crops and to deep-rooted crops, but erosion is likely unless conservation measures are used. Favorable yields of truck crops, corn, small grain, hay, and pasture are produced under good management. The tobacco produced is of high quality. The moisture-holding capacity is good, but during prolonged periods of drought, crops may be damaged. Rotating crops, planting winter cover crops, and contour strip cropping, are ways to protect this soil from erosion. Keeping waterways in sod is beneficial. (Capability unit IIe–5; irrigation group 9: woodland group 7; drainage group not assigned)

Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded (ShC2).—Except that it is sloping to strongly sloping and susceptible to serious damage by erosion, this soil is like the one described for the Sassafras series. In some places the surface layer contains some of the subsoil material, and in a few areas shallow gullies have formed. Included in mapping were some places where the surface layer contains a considerable amount of fine sand. Also included were a few areas where there is glauconite, or greensand, in the profile. A few spots are gravelly, and some spots are redder than normal and have a somewhat compacted subsoil.

This soil is suited to general crops and to deep-rooted crops. Under good management, it produces tobacco of high quality. The supply of moisture is generally good, but drought may occur during long dry periods. Rotation of crops, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sassafras sandy loam, 5 to 10 percent slopes, severely eroded (ShC3).—The surface layer of this severely eroded soil consists mostly of material from the subsoil and is browner or slightly redder than the surface layer of Sassafras sandy loam, 0 to 2 percent slopes. Also, the surface layer is somewhat sticky and tends to bake or crust when dry. Gullies have formed in a few areas.

This soil can be used only occasionally for cultivated crops. A suitable rotation is one that includes a row crop no more than once in 5 years. In such rotations, favorable yields of most general crops can be produced if management is good. The quality of tobacco is usually high. Permanent pasture and hay are suitable uses. Crop rotation, contour cultivation, contour stripcropping that has buffer strips, crop residue management, and minimum tillage are needed for protecting this soil from erosion. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Sassafras-Urban land complex, 0 to 5 percent slopes (SkB).—This complex consists of Sassafras soils and disturbed land that is mainly of Sassafras soil material. These areas are used for community developments. In about 20 percent of the complex, the Sassafras soils are undisturbed. In about 50 percent they have been covered with as much as 18 inches of fill material or have had as much as two-thirds of the original soil profile removed. The rest of the mapping unit consists of fills, 18 inches or more thick, or places where most of the Sassafras soil profile has been cut away. The fill material may be of any tex-

ture, but most commonly it is sandy, or gravelly, or both. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Sassafras-Urban land complex, 5 to 15 percent slopes (SkC).—Except for steeper slopes, this complex is like Sassafras-Urban land complex, 0 to 5 percent slopes. In about 10 percent of the complex the Sassafras soils are undisturbed. In about 50 percent they have been covered with as much as 18 inches of soil material or the profile has been partly cut away. The remaining 40 percent of the mapping unit consists of fills, 18 inches or more thick, or places where most of the Sassafras soil profile has been cut away. Some uses are limited by the steeper slopes. As much as 40 percent of this complex may be covered by streets, buildings, and other structures. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Sassafras-Urban land complex, 15 to 30 percent slopes (SkE).—Except that it is moderately steep to steep, this complex is similar to Sassafras-Urban land complex, 5 to 15 percent slopes, but it has more severe limitations for most uses. The percentage of undisturbed soils and of disturbed soils is about the same as that for Sassafras-Urban land complex, 5 to 15 percent slopes. A considerable part of this complex is used for buildings, roads, and the like. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Sassafras-Collington-Aura gravelly sandy loams, 12 to 20 percent slopes (SlD).—This complex of soils occurs mainly in the extreme southern and western parts of the county in the uplands at elevations well above the Potomac River, which is nearby. The soils are moderately steep, have fairly long slopes, and are on different kinds of sediments. The Sassafras soils developed on sand mixed with some silt and clay. The Collington soils developed on sediments containing a considerable amount of greensand, and the Aura soils developed on sediments containing much gravel. A profile of each of these soils is described in this report for the respective series.

The soils of this complex have lost some or nearly all of their original surface soil through erosion. In severely eroded areas, the surface layer has variable colors of brown or brown to red, but it is uniformly sandy in the Sassafras, sticky in the Collington, and gravelly in the Aura soils.

The soils of this complex can be used occasionally for cultivated crops. Cultivation is safe if the crop rotation is long and includes a row crop only once in about 5 years. In severely eroded areas, permanent pasture or trees are more suitable than row crops. Use of these strongly sloping soils for community development is severely limited. (Capability unit IVe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sassafras-Collington-Aura gravelly sandy loams, 20 to 35 percent slopes (SlE).—Except for steeper slopes, this complex is like Sassafras-Collington-Aura gravelly sandy loams, 12 to 20 percent slopes. Most of the acreage has remained in some kind of woodland plants, which is a good use. Well-sodded areas can be used for hay or pasture. Among the limitations of this complex for community development are downslope seepage of septic tank effluent and a severe risk of landslides or slumping where the slopes are cut or graded. (Capability unit VIe–2; woodland group 9; drainage group and irrigation group not assigned)

Shrewsbury Series

The Shrewsbury series consists of fairly deep, poorly drained soils that have a fairly dark surface layer. These soils developed in sandy and clayey materials that contain a moderate amount of greensand. The Shrewsbury soils are on nearly level to gently sloping uplands of the Coastal Plain, mainly in the central part of the county.

Profile of Shrewsbury silt loam (in a wooded area near Oak Grove):

A1—0 to 4 inches, very dark brown (10YR 2/2) silt loam; weak, fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; roots abundant; very strongly acid; clear, smooth boundary. 4 to 5 inches thick.

A2g—4 to 14 inches, grayish-brown (2.5Y 5/2) silt loam; few, fine, distinct mottles of yellowish brown (10YR 5/8); weak, thin, platy structure; slightly hard, friable, slightly sticky and slightly plastic; roots plentiful; slightly gritty; extremely acid; clear, smooth boundary. 8 to 12 inches thick.

B21tg—14 to 20 inches, olive-gray (5Y 5/2) heavy fine sandy clay loam; common, fine, distinct mottles of brown or dark brown (7.5YR 4/4); moderate, medium, blocky and subangular blocky structure; hard, friable to firm, sticky and plastic; roots common; distinct but discontinuous clay coatings; abundant, distinct particles of glauconite; extremely acid; gradual, smooth boundary. 6 to 8 inches thick.

B22tg—20 to 36 inches, olive-gray (5Y 5/2) fine sandy clay loam; common, medium, distinct mottles of brown or dark brown (7.5YR 4/4); weak, coarse, platy and very weak, medium, blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very few roots; abundant, distinct particles of glauconite; extremely acid; abrupt, smooth boundary. 12 to 18 inches thick.

C1irm—36 to 42 inches, variable dark olive-gray (5Y 3/2) and dark olive-green (5GY 3/2) indurated material containing much glauconite; very hard and brittle; abrupt, smooth boundary.

C2—42 to 60 inches +, olive-gray (5Y 4/2) sandy loam; coarse, distinct mottles and streaks of pale brown (10YR 6/3); single grain; loose to very friable, slightly sticky but nonplastic; very strongly acid.

In Prince Georges County, the A horizon of Shrewsbury soils is fine sandy loam or silt loam. The B2t horizon ranges from heavy sandy loam to loam and fine sandy clay loam in texture. The content of the clay in the B2t horizon ranges from 18 percent to about 30 percent. In most places the C1irm horizon is present, but it may be thin. The C2 horizon is sandy loam or loamy sand in which glauconite is conspicuous. The solum ranges from about 30 inches to 45 inches in thickness.

In cultivated areas the plow layer, when moist, has a value of 4 or 5. Hue commonly becomes more olive as depth increases; it may be as yellow as 10YR near the surface and as green as 5GY below the solum. In most places, however, hue is 2.5Y or 5Y. The A1 horizon has a value of 2 or 3, the thinner horizons having the lowest value. Throughout the profile, chroma of the matrix is normally 1 or 2, but in places it is 3. An A11 horizon, if it occurs, or an Ap horizon is normally mottled and has a hue of 10YR or redder, value that ranges from 4 to 6, and chroma that ranges from 3 to 8.

The Shrewsbury soils are on the same kinds of material as the well drained Collington soils and the moderately well drained Adelphia soils. The Shrewsbury are in many respects similar to Fallsington soils, which do not contain greensand and are more distinctly gray in color. The Colemantown soils are finer textured than the Shrewsbury soils and tend to be more greenish in color.

The Shrewsbury soils are fairly extensive in the county. If they are drained, they are good soils for farming. They occur on glauconitic formations throughout the central part of the county. Because these soils have poor

natural drainage, use for community development is limited. The native vegetation is primarily wetland hardwoods and some pond pines.

Shrewsbury fine sandy loam, 0 to 2 percent slopes (SmA).—This soil is typical of Shrewbsury soils that occur in areas that have a fine sandy loam surface layer. Poor natural drainage limits the use of this soil for farming. Included in mapping were several small spots that are wetter than this soil and have a darker surface layer. Also included were some areas that are coarser textured than fine sandy loam. (Capability unit IIIw–6; drainage group 7–B; woodland group 1; irrigation group 9)

Shrewsbury fine sandy loam, 2 to 5 percent slopes (SmB).—Except for slopes, this soil is like Shrewsbury fine sandy loam, 0 to 2 percent slopes. Drainage is the most important problem of management, but erosion is a moderate hazard. Included in mapping were some eroded spots and a few areas that have slopes of slightly more than 5 percent. (Capability unit IIIw–6; drainage group 7–B; woodland group 1; irrigation group 9)

Shrewsbury silt loam, 0 to 2 percent slopes (SnA).—This is the soil described for the Shrewsbury series. Included in mapping were a few spots that are wetter than this soil and have a darker surface layer.

Wetness is the most important problem of management on this soil. Either ditches or tile can be used for drainage. If this soil is adequately drained, it is suited to corn and soybeans and to some hay and pasture plants. On this soil, erosion is not a problem. Row crops can be grown for several successive years if cover crops are used and the soil is allowed to lay fallow every few years. Limitations to use for community development are severe. (Capability unit IIIw–7; drainage group 7–A; irrigation group 13; and woodland group 1)

Shrewsbury-Urban land complex (So).—This complex consists of Shrewsbury soils and disturbed land that is mainly of Shrewsbury soil material. These areas have been modified by community developments. About 20 percent of each area mapped consists of Shrewsbury soils like the soil described as typical of the Shrewsbury series. About 40 percent are Shrewsbury soils that have been covered with as much as 18 inches of various kinds of fill materials. The rest consists of Shrewsbury soils that have been covered with 18 inches or more of fill. Generally, areas were filled so that streets, buildings, parking lots, and playgrounds could be constructed. (Drainage group 7–B; capability unit, irrigation group, and woodland group not assigned)

Silty and Clayey Lands

Silty and clayey lands are miscellaneous land types that are similar to Sandy and clayey lands, which are discussed on page 57. Three units of Silty and clayey land have been mapped in Prince Georges County according to their slope.

Silty and clayey land, gently sloping (SpB).—In this mapping unit, the surface layer is dominantly silty. The moisture-holding capacity is high, but productivity is fairly low. Erosion is difficult to control and is a problem if this land is cropped. (Capability unit IIIe–42; irrigation group 12; woodland group 14; drainage group not assigned)

Silty and clayey land, sloping (SpC).—On this sloping land the hazard of erosion is high. Generally, pasture is the most intensive suitable use, though a cultivated crop can be grown if protection is exceptionally good. A highly protective cover of plants is needed most of the time. (Capability unit IVe–3; irrigation group 12; woodland group 14; drainage group not assigned)

Silty and clayey land, steep (SpE).—This land is too steep for safe cultivation and too unstable for many other uses. It should be kept under a permanent cover of deep-rooted protective plants, and used only for a limited amount of grazing. (Capability unit VIIe–2; woodland group 16; drainage group and irrigation group not assigned)

Sunnyside Series

The Sunnyside series consists of deep, well-drained soils that developed in fine sandy sediments, which contain a considerable amount of reddish clay. These soils occupy nearly level to steep uplands on the Coastal Plain, mainly in the northwestern part of the county between the District of Columbia and the Howard County line.

Profile of Sunnyside fine sandy loam (in a cleared but idle area on Beaverdam Road, about 500 feet east of the Baltimore-Washington Parkway):

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, fine, granular structure; slightly hard, very friable, slightly sticky but nonplastic; roots plentiful; strongly acid; clear, smooth boundary. 1 to 3 inches thick.

A2—2 to 8 inches, brown (7.5YR 5/4) fine sandy loam; weak, fine, granular structure; slightly hard, very friable, slightly sticky and slightly plastic; roots common to plentiful; strongly acid; clear, smooth boundary. 6 to 8 inches thick.

B1—8 to 12 inches, reddish-brown (5YR 5/4) heavy fine sandy loam; moderate, medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; roots common; very strongly acid; gradual, irregular to broken boundary. 0 to 5 inches thick.

B2t—12 to 32 inches, red (2.5YR 4/6) fine sandy clay loam; moderate to strong, medium and coarse, subangular blocky structure; hard, friable to firm, sticky and plastic; roots common in upper part; thin but continuous clay coatings; very strongly acid; diffuse boundary. 15 to 25 inches thick.

B3—32 to 48 inches, red (2.5YR 5/6) fine sandy loam; weak, coarse, blocky structure; friable, sticky and slightly plastic; few weak accumulations of light reddish-brown (5YR 6/4) clay; very strongly acid; clear, irregular boundary. 8 to 20 inches thick.

C—48 to 60 inches +, reddish-brown (5YR 5/4) loamy fine sand; single grain; loose; some very thin lenses of grayish clayey material; extremely acid.

In Prince Georges County, the normal A horizon of Sunnyside soils is loam or fine sandy loam. In severely eroded areas, however, the plow layer is normally sandy clay loam. The B2t horizon is sandy clay loam or fine sandy clay loam, or in some places heavy loam. It has a content of clay that ranges from 18 to 35 percent. B1 and B3 horizons, if present, are finer textured than the normal A horizon but coarser textured than the B2t horizon. The C horizon ranges from loamy fine sand to very light fine sandy clay loam in texture. It may contain some red or particolored clay similar to that of a nonconforming IIC2 horizon, which may occur within a 6-foot depth.

In cultivated areas the plow layer ranges from dark grayish brown in uneroded areas to reddish brown in severely eroded areas. Hue ranges from 10YR to 5YR in the A horizon and from 5YR to 10YR in the B1 horizon, but generally it is 2.5YR in the B2t. The B2t horizon normally has a value of 4 or 5, and chroma

that ranges from 6 to 8. The C horizon is similar to the B1 horizon in color, but normally chroma is lower. The IIC horizon, if present, is generally red but may be particolored.

The Sunnyside soils are like the Sassafras soils but are distinctly redder in color and are normally thicker. They are not so intensely red as the Christiana soils, which are commonly nearby, and are more sandy throughout.

The Sunnyside soils are fairly extensive in Prince Georges County and occur mostly in the northwestern part of the county. They are good soils for farming. Except for slope and the hazard of erosion, Sunnyside soils have no specific limitations for use in residential areas. The native vegetation is chiefly upland oak and other hardwoods, and there are some Virginia pines.

Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded (StB2).—This soil is like the one described for the Sunnyside series. The risk of erosion is moderate. Included in mapping were some places where the surface layer contains much coarse sand and a few areas that have a thick sandy surface layer and a subsoil of sticky red clay. Also included were a few places that are severely eroded, some that are uneroded, and others where shallow gullies have formed.

This soil is suited to most general crops. Crop rotations, winter cover crops, contour farming, diversion terraces, and sodded waterways are practices needed to help control erosion. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Sunnyside fine sandy loam, 5 to 10 percent slopes, moderately eroded (StC2).—Except for steeper slopes, this soil is like Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded. Some areas are uneroded or only slightly eroded, but in many places shallow gullies have formed.

This soil is suited to most general crops. It holds a good supply of moisture for plants, but it may be somewhat droughty during long dry periods. Rotation of crops, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sunnyside fine sandy loam, 10 to 15 percent slopes, moderately eroded (StD2).—This soil is too sloping to be safe for regular cultivation. If conservation measures are carefully applied, a cultivated crop can be safely grown about once in 5 years if the soil is kept under a cover of protective plants the rest of the time. Included in mapping were some gravelly, sandy, and yellowish-colored spots. (Capability unit IVe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Sunnyside fine sandy loam, 15 to 30 percent slopes (StE).—This steep soil should not be used for cultivated crops, though it may produce some good hay or pasture. This soil is good for use as woodland and for wildlife habitats. Included in mapping are some spots that were a little more sandy, and others that are a little more silty, than is typical for this soil. (Capability unit VIe–2; woodland group 9; irrigation group and drainage group not assigned)

Sunnyside loam, 0 to 5 percent slopes, moderately eroded (SuB2).—This soil contains more silt and less sand in the A horizons than the soil described for the series. The risk of erosion is moderate. Included in mapping were some places that are uneroded or only slightly eroded and other places where a few shallow gullies have formed. Also included are a few areas that have a red sandy clay subsoil containing greensand, or glauconite.

This soil is well suited to most general crops. Crop rotations should include hay at least 1 year in 3 or 4. Contour strips are needed in all fields that have long slopes. Waterways should be kept in sod. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Sunnyside loam, 5 to 10 percent slopes, moderately eroded (SuC2).—This soil is steeper than Sunnyside loam, 0 to 5 percent slopes, moderately eroded, and is more susceptible to erosion. Included in mapping were some uneroded areas and a few slightly eroded areas. Also included were some small gravelly spots and a few areas that have a red sandy clay subsoil containing greensand, or glauconite.

This soil is well suited to general crops and to deep-rooted crops. Although yields of tobacco are favorable, the quality of the tobacco may be medium. Crop rotations, contour stripcropping, diversion terraces, and sodded waterways are needed to help check erosion. (Capability unit IIIe–4; irrigation group 13; woodland group 8; drainage group not assigned)

Sunnyside loam, 10 to 15 percent slopes, moderately eroded (SuD2).—This moderately steep soil is suitable for occasional cultivation. Included in mapping were some areas that are only slightly eroded and a few areas where shallow gullies have formed. Also included were a few areas, some of them silty, that have a red subsoil containing greensand, or glauconitic materials.

This soil is suitable for regular cultivation only about once in 5 years, and then only in rotations with protective plants. Strong conservation measures are needed. (Capability unit IVe–3; irrigation group 13; woodland group 8; drainage group not assigned)

Sunnyside sandy clay loam, 5 to 10 percent slopes, severely eroded (SvC3).—This soil has lost all or nearly all of its original surface layer through erosion. In most places the surface layer now is reddish brown, rather firm, and sticky. Included in mapping were a few gravelly areas.

This soil is fairly difficult to cultivate and to manage. It can be used occasionally for crops if they are grown in a long rotation and supporting conservation measures are used. (Capability unit IVe–3; irrigation group 14; woodland group 13; drainage group not assigned)

Sunnyside sandy clay loam, 10 to 15 percent slopes, severely eroded (SvD3).—This strongly sloping, severely eroded soil is not suitable for cultivated crops, but good hay or pasture plants can be grown. Also suitable are lawns and turf in public areas, but they may require special treatment. Other suitable uses are woodland or community development. A few gravelly areas are included in mapping. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Sunnyside-Urban land complex, 0 to 5 percent slopes (SwB).—This complex consists of Sunnyside soils and disturbed land that is mainly of Sunnyside soil material. These areas have been modified by use for community developments. About 20 percent of each area mapped as this complex consists of undisturbed Sunnyside soils. About 60 percent consists of Sunnyside soils that have either been covered by as much as 18 inches of fill material or has had about two-thirds of the original profile removed.

The rest consists of fills, 18 inches or more thick, or places where most or all of the Sunnyside soil profile has been removed. Many areas of this complex are covered by buildings, streets, parking lots, and the like. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Sunnyside-Urban land complex, 5 to 15 percent slopes (SwC).—Except for steeper slopes, this complex is like Sunnyside-Urban land complex, 0 to 5 percent slopes. About 10 percent of this complex consists of the Sunnyside soils in undisturbed areas. About 50 percent is covered with as much as 18 inches of soil material or has had as much as two-thirds of the soil profile removed. About 40 percent consists of fills, more than 18 inches thick, or places where most of the Sunnyside soil profile has been removed. The soil material used as fill has variable texture. (Capability unit, irrigation group, woodland group, and drainage group not assigned)

Swamp

In Prince Georges County, Swamp consists of fairly large areas of very wet land that stands under fresh water a large part of the time. This land is not used for farming. Because these areas are swampy, they have not been examined in great detail. This land may consist of sand, silt, clay, gravel, muck, or peat, or a mixture of any of these materials.

Swamp (Sx).—This miscellaneous land type is generally wooded, but it produces little usable timber and is too wet for normal woodland management. Swamp is generally suitable only as a habitat for wetland wildlife. Some parts of it in public parks and recreational areas might be developed for hiking, nature study, hunting, fishing, or similar activities. (Capability unit VIIw–1; drainage group, irrigation group, and woodland group not assigned)

Tidal Marsh

Tidal marsh consists of many small and a few fairly large areas that are covered regularly with tidal water. In Prince Georges County, most areas of Tidal marsh border the Potomac and the Patuxent Rivers, but a few are along the Anacostia River and other secondary streams. The soil material in these areas has not been examined in detail, but it ranges from sand to clay and, in some places, is mucky or peaty. In Prince Georges County, none of these areas are very salty, but many of them are brackish.

Tidal marsh commonly supports only grasses, sedges, and a few other herbaceous plants, but in some places it supports shrubs. Generally, there are no trees other than willows and the like. All areas of Tidal marsh are likely to be flooded by unusually high tides.

Tidal marsh (Tm).—This miscellaneous land type is not used for farming. It does not produce crops, pasture, or timber and probably will never be reclaimed for any of these purposes. The only practical uses are as wildlife habitats and, in some channels, for fishing or boating. Some areas have been filled by dredges or other means, and others may be. Such reclaimed areas are classified as Made land, which is discussed elsewhere in this report. (Capability unit VIIIw–1; drainage group, irrigation group, and woodland group not assigned)

217-092—67——5

Westphalia Series

The Westphalia series consists of deep, well-drained soils that developed in thick deposits of fine sand and very fine sand containing a small amount of fine material, mostly clay. The sand grains in these soils are especially fine and uniform in size. These soils occur in the higher parts of the Coastal Plain uplands, mostly in the central part of the county. They are nearly level to very steep.

Profile of Westphalia fine sandy loam (in a wooded area on U.S. Highway No. 301, about 1 mile north of Upper Marlboro):

A1—0 to 4 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; soft, loose, nonsticky and nonplastic; roots plentiful; strongly acid; clear, wavy boundary. 2 to 4 inches thick.

A2—4 to 10 inches, yellowish-brown (10YR 5/4) light fine sandy loam; weak, medium, granular structure; soft, loose, nonsticky and nonplastic; roots common to plentiful; strongly acid; clear, smooth boundary. 6 to 10 inches thick.

B2t—10 to 18 inches, strong-brown (7.5YR 5/6) heavy fine sandy loam that contains less silt but distinctly more clay than the A horizon; weak, medium, subangular blocky structure; soft, very friable, slightly sticky but nonplastic; roots few to common; faint clay coatings on upper surface of aggregates; strongly acid and very strongly acid; gradual, irregular boundary. 5 to 16 inches thick.

B3—18 to 28 inches, brownish-yellow (10YR 6/6) loamy fine sand; weak, fine, granular structure to single grain; soft to very friable; very few roots; some irregular accumulations of material from B2t horizon in upper part; faintly stratified; strongly acid to very strongly acid; gradual, irregular boundary. 0 to 20 inches thick.

C—28 to 120 inches +, pale-yellow (2.5Y 7/4) fine sand or light loamy fine sand, faintly variegated with light gray (2.5Y 7/2) and light yellowish brown (2.5Y 6/4); loose; single grain; very strongly acid.

In Prince Georges County, the A horizon is fine sandy loam or very fine sandy loam that is in the sandier part of the texture range. The texture of the B2t horizon ranges from fine or very fine sandy loam to fine or very fine heavy sandy loam. The content of clay in the B2t horizon ranges from about 10 to 18 percent, but the content of silt is low. The C horizon ranges from fine sand to light loamy very fine sand, and its clay content is less than 10 percent. A few grains of glauconite occur in the C horizon. The solum ranges from 15 to 36 inches in thickness.

The hue of the A horizon of Westphalia soils is normally 10YR, value ranges from 3 to 5, and chroma ranges from 2 to 4. The lowest value and chroma are in the A1 horizon, and the highest are in the A2 horizon. The B2t horizon has a hue of 10YR or 7.5YR, a value of 4 or 5, and a chroma ranging from 6 to 8. The colors in the C horizon are paler than those in the solum and have higher value. The hue in the C horizon is 10YR or 2.5Y. In places the C horizon is variegated or streaked.

The Westphalia soils are on the same kinds of material as the well-drained Marr and Howell soils. In contrast to the Marr soils, the Westphalia soils have a thinner, less strongly expressed subsoil and contain less clay and other fine material throughout the profile. The Westphalia soils also have a thinner, less strongly expressed subsoil than the Howell soils and contain less clay and much less silt. The Westphalia soils are yellower and have a much thinner subsoil than the Sassafras soils.

The Westphalia soils are in rather large, almost continuous areas in the county and have a large total acreage. They are important for farming; most areas have been farmed since early colonial times. The native vege-

Figure 7.—**Westphalia fine sandy loam, 2 to 6 percent slopes, severely eroded, is in left foreground. Towards the right is the Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded. Much soil material has washed away because these soils have been cultivated and not protected for many years. Westphalia fine sandy loam, 12 to 20 percent slopes, moderately eroded, on the hill in the background, has been cleared for only a few years and has been protected by a cover of grass most of the time.**

tation is mainly mixed upland hardwoods, but they have been invaded locally by a considerable amount of Virginia pine.

Westphalia fine sandy loam, 0 to 2 percent slopes (WaA).—This is the soil described for the Westphalia series. It is well suited to most general crops and to deep-rooted crops. It has a moderate moisture-holding capacity and is productive under good management. The tobacco grown is of very high quality. In places where slopes are long, farming on the contour is a good practice, and grassed waterways are needed to help control runoff. (Capability unit I–5; irrigation group 9; woodland group 7; drainage group not assigned)

Westphalia fine sandy loam, 2 to 6 percent slopes, moderately eroded (WaB2).—This soil is like Westphalia fine sandy loam, 0 to 2 percent slopes, but it is more sloping and more eroded. The risk of erosion is moderate. Included in mapping were a few places where the soil is shallower to the underlying sand than the less sloping soil and places where the surface layer is mixed with the brown subsoil material. Also included were some areas where a few shallow gullies have formed.

This soil is well suited to general crops and to deep-rooted crops. It produces tobacco of very high quality. Row crops should be followed by small grain or a winter cover crop. This soil may be somewhat droughty during long dry periods. It is readily eroded unless it is adequately protected. Farming in contour strips is advisable. Diversion terraces are needed on long slopes, and drainageways should be kept in sod. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Westphalia fine sandy loam, 2 to 6 percent slopes, severely eroded (WaB3).—This soil has had most or all of the original surface soil removed through erosion (fig. 7). The plow layer is browner than that of the original surface soil. It is slightly sticky but is not difficult to work. Included in mapping were a few areas where shallow gullies have formed.

This soil is suited to general crops and to deep-rooted crops. It produces tobacco of very high quality. Some droughtiness is likely during long dry periods. Contour stripcropping, diversion terraces, and grassed waterways are needed to help control erosion and conserve moisture. (Capability unit IIIe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded (WaC2).—Except that it is sloping to strongly sloping, this soil is like the one described for the Westphalia series. Because severe damage by erosion is likely, use is severely limited. In some places the surface layer is a mixture of the original surface soil and some subsoil material. Shallow gullies have formed in some fields.

This soil is suited to general crops and to deep-rooted crops. It produces tobacco of very high quality if management is good. This soil holds a moderate supply of moisture available for plants, but it may be somewhat droughty during long dry periods. Rotation of crops, contour strips, diversion terraces, and sodded waterways are needed to help control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded (WaC3).—This soil has lost most of its original surface soil through erosion. Many shallow gullies and a few deep ones have formed. Included in mapping were some areas that have a large amount of very fine sand in the surface layer.

This soil can be used occasionally for cultivated crops. It is suited to most general crops and to deep-rooted crops, and it produces tobacco of very high quality. It is well suited to orchards that have a permanent cover of sod, and to hay and permanent pasture. Among the practices needed to help control erosion are rotation of crops, contour cultivation, contour stripcropping that includes buffer strips, management of crop residue, and minimum tillage. In places diversion terraces may be needed, and all waterways should be kept in sod. This soil has severe limitations for use in community development. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Westphalia fine sandy loam, 12 to 20 percent slopes, moderately eroded (WaD2).—Unless this moderately steep soil is carefully protected, it is highly susceptible to erosion. Included in mapping were many places where gullies have formed. Some of the gullies are deep.

This soil can be used occasionally for cultivated crops. It is deep and is suited to most general crops. The tobacco produced is usually of very high quality. Yields from orchards are favorable if a permanent cover of sod is used. Hay and permanent pasture are safe and suitable uses (see fig. 14). Measures needed to help control erosion include rotation of crops, contour cultivation, contour stripcropping that has buffer strips, management of crop residue, and minimum tillage. In places diversion terraces may be needed, and all waterways should be kept in sod. Limitations to use of this soil for community development are severe. (Capability unit IVe–5;

irrigation group 9; woodland group 8; drainage group not assigned)

Westphalia fine sandy loam, 12 to 20 percent slopes, severely eroded (WaD3).—This soil has lost all of its original surface soil through erosion and, in many places, much subsoil material. In some areas the surface layer consists entirely of the loose sand that normally is the underlying material of the Westphalia soils. Many shallow and some deep gullies have formed. Included in mapping were a few areas that have a very fine sand surface layer.

This soil is not suitable for cultivated crops. Protective plants are needed. Suitable for this soil are woodland, grazing, or a less intensive use. Use for community development is severely limited. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Westphalia very fine sandy loam, 0 to 6 percent slopes, moderately eroded (WbB2).—The sand in the surface layer and subsoil of this soil is so fine that it feels distinctly soft and has some characteristics of silt. Most of this soil is gently sloping. The surface layer is mixed with only a small amount of subsoil material. Included in mapping were a few places where shallow gullies have formed and some areas that are not eroded.

This soil is well suited to general crops and to deep-rooted crops. It holds a good supply of moisture for plants. Yields of tobacco are favorable, but the quality generally is not so good as that of tobacco on soils having a sandier surface layer. Contour strips, diversion terraces, and sodded waterways are needed to control erosion. A winter grain or a cover crop should follow each row crop. (Capability unit IIe–4; irrigation group 13; woodland group 7; drainage group not assigned)

Westphalia very fine sandy loam, 6 to 12 percent slopes, moderately eroded (WbC2).—This soil is typical of Westphalia soils that occur in areas having very fine sandy loam throughout the profile. It is susceptible to severe damage by erosion. Included in mapping were places where the surface layer is mixed with some of the subsoil material and a few areas where some shallow gullies have formed.

If it is properly managed, this soil produces favorable yields of truck crops, corn, small grain, hay, and pasture. Favorable yields of tobacco are also produced, but the quality may be medium. Crop rotations, contour stripcropping, diversion terraces, and sodded waterways are needed to help check erosion. (Capability unit IIIe–4; irrigation group 13; woodland group 8; drainage group not assigned)

Westphalia very fine sandy loam, 12 to 20 percent slopes, moderately eroded (WbD2).—Because this soil is on moderately steep hillsides and consists of very fine sand, almost silt size, it is highly susceptible to erosion. Included in mapping were a few areas where the surface layer is mixed with some of the brown, sticky subsoil material and places where some shallow gullies have formed.

This soil is suited to general crops, but it can be cultivated only occasionally. The tobacco quality may be medium, but favorable yields can be expected if management is good. Practices needed to control erosion include contour cultivation, stripcropping that has buffer strips, minimum tillage, and terracing where needed. Waterways should be kept in sod. (Capability unit IVe–3; irrigation group 13; woodland group 8; drainage group not assigned)

Westphalia-Evesboro complex, 2 to 6 percent slopes, moderately eroded (WeB2).—This complex consists of intricately mixed areas of Westphalia and Evesboro soils. The more extensive Westphalia soils are somewhat like the soil described for the Westphalia series and are finer textured than the Evesboro soils. The Evesboro soils consists of coarse sand and a large amount of smooth pebbles. The Evesboro are in dunelike deposits scattered among Westphalia soils. Included in mapping were areas that are nearly level and only slightly eroded and a few spots that are severely eroded. Also included were some places where shallow gullies have formed.

The soils of this complex are suited to general crops and to deep-rooted crops, and they produce tobacco of high quality. Row crops should be followed by small grain or a winter cover crop. These soils may be somewhat droughty during long dry periods. They are very easily eroded unless adequately protected. Farming in contour strips is desirable. Diversion terraces are needed on long slopes, and drainageways should be kept in sod. (Capability unit IIe–5; irrigation group 9; woodland group 7; drainage group not assigned)

Westphalia-Evesboro complex, 6 to 12 percent slopes, moderately eroded (WeC2).—Except for steeper slopes, this complex is like Westphalia-Evesboro complex, 2 to 6 percent slopes, moderately eroded. The topography is rough, for there are many knolls and hillocks and many short, irregular, complex slopes. Some shallow gullies have formed in places.

The soils in this complex are suited to general crops and to deep-rooted crops. Tobacco of high quality is produced. The soils may be somewhat droughty during long dry periods. Field strips and grassed waterways are needed to help control erosion and conserve moisture. It may be difficult to fit contour strips to the irregular topography. (Capability unit IIIe–5; irrigation group 9; woodland group 8; drainage group not assigned)

Westphalia-Evesboro complex, 6 to 12 percent slopes, severely eroded (WeC3).—Because the soils in this complex are severely eroded, most of their surface layer consists of subsoil material. Many shallow gullies, and a few deep ones, have formed.

These soils can be used only occasionally for cultivated crops. They are suited to most general crops and to deep-rooted crops, and they produce tobacco of high quality. They are well suited to orchards if a permanent cover of sod is used. Hay and permanent pasture are suitable uses. All conservation measures that can be applied should be used to help control erosion. These measures include rotation of crops, field stripcropping that includes buffer strips, crop residue management, and minimum tillage. In places diversion terraces may be needed, and all waterways should be kept in sod. Use of these soils for community development is severely limited. (Capability unit IVe–5; irrigation group 9; woodland group 13; drainage group not assigned)

Westphalia-Evesboro complex, 12 to 20 percent slopes, severely eroded (WeD3).—Except that it is on moderately steep hillsides, this soil complex is like the Westphalia-Evesboro complex, 6 to 12 percent slopes, severely eroded. Many gullies, some of them deep, have formed. A few areas are only moderately eroded.

The soils of this complex are not suited to cultivated crops. They may be used as woodland, for grazing, or for other less intensive uses. Use of these soils for community development is severely limited. (Capability unit VIe–2; woodland group 13; drainage group and irrigation group not assigned)

Woodstown Series

The Woodstown series consists of deep, moderately well drained soils that have a mottled lower subsoil through which water moves readily. These soils developed in old deposits of sandy material that contained a moderate amount of silt and clay. The Woodstown soils are on nearly level to gently sloping uplands.

Profile of Woodstown sandy loam (in an idle field south of Bowie):

Ap1—0 to 4 inches, brown or dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; soft, friable, nonsticky and nonplastic; roots plentiful; very strongly acid; abrupt, smooth boundary. 3 to 4 inches thick.

Ap2—4 to 9 inches, brown or dark-brown (10YR 4/3) sandy loam; few, medium, faint mottles of brown or dark brown (7.5YR 4/4); weak, medium, platy structure (characteristic of a plow pan); hard, firm, nonsticky and nonplastic; roots fairly plentiful; very strongly acid; abrupt, smooth boundary. 4 to 7 inches thick.

A2—9 to 12 inches, yellowish-brown (10YR 5/4) sandy loam; weak, coarse, granular structure; slightly hard, friable, nonsticky and nonplastic; roots plentiful; very strongly acid; clear, smooth boundary. 3 to 4 inches thick.

B21t—12 to 23 inches, yellowish-brown (10YR 5/6) fine sandy clay loam; moderate, medium, blocky structure; hard, friable, slightly sticky and slightly plastic; roots common; faint yellowish-brown (10YR 5/4) clay coatings; very strongly acid to extremely acid; clear, smooth boundary. 10 to 20 inches thick.

B22t—23 to 36 inches, yellowish-brown (10YR 5/8) fine sandy clay loam; common, medium, faint mottles of strong brown (7.5YR 5/6) and common, medium, distinct mottles of light brownish gray (2.5Y 6/2) and yellowish red (5YR 4/6); weak, thick, platy and moderate, medium, blocky structure; hard, friable to firm, sticky and plastic; very few roots; distinct but discontinuous yellowish-brown (10YR 5/4) clay coatings; extremely acid; abrupt, smooth boundary. 10 to 20 inches thick.

Cg—36 to 54 inches +, light brownish-gray (2.5Y 6/2) sandy loam; common, medium and coarse, prominent mottles of strong brown (7.5YR 5/6); massive to very weak, coarse, blocky structure; slightly hard, very friable, nonsticky but slightly plastic; extremely acid.

In Prince Georges County, the A horizon of Woodstown soils is generally sandy loam, but there are minor local variations. In most places the B2t horizon is generally sandy clay loam or fine sandy clay loam, but it is heavy sandy loam or loam in some places. The content of clay in the B2t horizon ranges from 18 to 35 percent. The C horizon is sandy loam or heavy loamy sand. The solum ranges from about 28 to 42 inches in thickness.

In undisturbed areas the A1 horizon is normally 2 to 5 inches thick. Hue throughout is 10YR or 2.5Y and is normally yellower as depth increases. In places the lower part of the B horizon is as yellow as 5Y. Value in the B2t horizon is 5 or 6, and chroma ranges from 4 to 6 or in some places to 8. The upper 10 inches of the B2t horizon is free of mottles, but below 10 inches the B2t horizon is mottled with variable colors that always have some chroma of 2 or less. In most places the C horizon is gleyed.

The Woodstown soils are on the same kinds of material as the well-drained Sassafras soils and the poorly drained Fallsington soils. The Woodstown soils are much like the Adelphia soils, which are more olive and contain a considerable amount of greensand. The Keyport soils have a finer textured subsoil than the Woodstown soils, and water moves through them more slowly.

The Woodstown soils are fairly extensive in Prince Georges County. They are widely distributed, generally in fairly small areas. These are good soils for farming if drainage is improved. Impeded drainage is a problem in residential development. The native vegetation is mostly mixed hardwoods and some pines.

Woodstown sandy loam, 0 to 2 percent slopes (WoA).—The surface layer of this soil contains a large amount of medium or coarse sand. Included in mapping were some areas that have a fine sandy loam surface layer. Also included were some areas that contain silvery flakes of mica throughout the profile.

This soil is suitable for most crops after drainage is improved. Because this soil transmits water readily, drainage can be improved by installing open ditches or tile. The sandy surface layer is easy to cultivate, and under good management, the soil is highly productive. (Capability unit IIw–5; drainage group 2–B; irrigation group 9; and woodland group 3)

Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded (WoB2).—Because this soil is more sloping than Woodstown sandy loam, 0 to 2 percent slopes, surface water drains away more readily. Included in mapping were some places where the surface soil is thinner than normal, and a few places where shallow gullies have formed. Also included were areas where the surface layer is fine sandy loam and a few areas that are severely eroded. In some places silvery flakes of mica are in the profile, and there are a few gravelly spots.

Drainage may be needed for some crops. If this soil is to be used safely in regular cultivation, conservation measures are needed for protection against erosion. Farming should be in graded rows or in graded strips of row crops alternated with close-growing crops. (Capability unit IIe–36; drainage group 2–B; irrigation group 9; and woodland group 3)

Woodstown sandy loam, 5 to 10 percent slopes, moderately eroded (WoC2).—Except for steeper slopes, this soil is like Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded. Included in mapping were some areas where the surface layer is fine sandy loam. Also included were some severely eroded areas and a few places where gullies have formed. In some areas silvery flakes of mica are in the profile, and a few spots are wetter than normal.

This soil has good surface drainage. The control of erosion is the most important problem of management, though drainage should be improved where feasible. Erosion can be controlled and drainage improved by farming in graded strips and by using diversion terraces on long slopes. Cover crops or winter grain should follow row crops. (Capability unit IIIe–36; drainage group 2–B; irrigation group 9; and woodland group 9)

Woodstown-Urban land complex (Wu).—This complex consists of nearly level to gently sloping Woodstown soils and disturbed land that is mainly of Woodstown soil material. These areas have been used for community developments. These soils have been disturbed and rearranged on the landscape. About 25 percent of each area mapped as this complex consists of typical Woodstown soils, and about 55 percent consists of Woodstown soils that have been covered with as much as 18 inches of fill materials or have had as much as two-thirds of their soil profile removed. The rest consists of areas

that have been covered by fills, 18 inches deep or more, or places where the Woodstown soil profile has been cut away. Generally, more filling than cutting has been done on the soils of this complex. The filled areas are used largely for the construction of streets, buildings, parking lots, and playgrounds. (Drainage group 2–B; capability unit, irrigation group, and woodland group not assigned)

Use and Management of the Soils

This part of the survey has several subsections. Because cropland in the county is being used rapidly for building sites, streets and roads, shopping centers, and recreational areas, the use of soils in community development is first discussed. The second subsection gives information, mainly in tables, about the use of soils in engineering. In the third part, the system of capability classification used by the Soil Conservation Service is given, and some suggestions for managing soils by capability units are made. Other subsections discuss drainage groups and irrigation groups of soils, give estimates of average yields of common crops under two levels of management, and describe use of soils as woodland and for wildlife. Also discussed is the use of the soil survey in community planning.

Community Development

This subsection consists of two main parts. The first part describes the residential and related uses of the soils and provides a table that rates the degree and lists the kind of limitations of each soil in the county for specified uses. The second part discusses the use of soils for several recreational activities and rates, in a table, the limitations of each soil for specified recreational uses.

Uses of soils in community development

Farming, particularly the production of tobacco, is still important to the economy of Prince Georges County, but the county generally is used for residential or other nonfarm purposes. The county is part of the metropolitan area around Washington, D.C., and its percentage of land in farms is among the lowest of any county in Maryland. Also, it has the largest area of nonfarm land or residential land of any county in the State.

The population of Prince Georges County is increasing rapidly, and this rate is expected to continue for several years. This rapid increase in population has brought a corresponding increase in residential and related uses of the land—particularly for apartment dwellings.

Accompanying these increased uses of land are strong requests for information about soil and land conditions that affect nonfarm uses. The most urgent need is for information about the limitations of soils for use in the disposal of sewage effluent from septic tanks and as foundations for many kinds of buildings, mainly houses and apartment buildings (fig. 8). Less urgent is the need for information about the use of soils in earthmoving and landscaping, for sanitary land fills, for streets and parking lots, and for other uses.

Table 4 rates the degree and lists the kind of limitations of each soil in Prince Georges County for specified

Figure 8.—Top: **This land has been stripped of vegetation prior to building homes. No attempt has been made to control soil erosion, and every rain washes away some soil.** *Middle:* **Some houses have been built but still no attempt has been made to control erosion. The gullies and other soil erosion and the ruined drainage ditch at the left are the result.** *Bottom:* **When erosion is not controlled in residential areas, gullies may undermine the foundations as shown.**

uses. This table can be used as a general guide by those concerned with many uses in community development. It should be particularly helpful to planning and zoning boards and commissions and to those who develop areas for residential and other community uses. In addition, it should be helpful to the individual landowner.

In table 4 the limitation of each soil in the county for specified nonfarm uses is rated *slight*, *moderate*, or *severe*. A rating of slight may indicate that the soil has no limitations, though most soils in the county are at least slightly limited in use. These ratings are made on the basis of the greatest single limitation, but more than one limitation may be listed. For example, flooding may be a severe limitation of a soil for some uses, but poor drainage may also be listed because it limits the soil for other uses.

A rating of severe for a particular use does not necessarily mean that the soil so rated cannot be put to that use. For example, a soil that has a high water table is rated severe for cemeteries, but it can be used for cemeteries if drainage is improved or the water table is lowered. A soil that has a wet, plastic, unstable substratum can be used as foundations for homes if it can be drained and stabilized, but the expense of draining and stabilizing the soil may not be justified.

Following are the main factors that limit the soils in this county for specified uses, as shown in table 4.

DISPOSAL OF SEWAGE EFFLUENT FROM SEPTIC TANKS: Permeability of the soil, depth to a seasonally high

TABLE 4.—*Limitations of soils*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made land

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Adelphia:			
AdA, AhA	Severe: seasonally high water table; impeded drainage.	Slight	Moderate: seasonally high water table.
AdB2, AhB2	Severe: seasonally high water table; impeded drainage.	Moderate: slope	Moderate: seasonally high water table.
AdC2	Severe: seasonally high water table; impeded drainage.	Severe: slope	Moderate: seasonally high water table.
Aura:			
AuB2	Moderate: hard layer	Moderate: slope	Slight
AuC2, AuC3	Severe: hard layer; slope	Severe: slope	Slight
AuD, AvE, SID, SIE (For limitations of Croom soil in mapping unit AvE, and those of Sassafras and Collington soils in units SID, and SIE, refer to interpretations in this table for the Croom, Sassafras, and Collington series, respectively.)	Severe: slope	Severe: slope	Moderate to severe: slope
Beltsville:			
BeA, BlA	Severe: perched water table; impeded drainage.	Slight	Moderate: perched water table; impeded drainage.
BeB2, BlB2, BmB	Severe: perched water table; impeded drainage.	Moderate: slope	Moderate: perched water table; impeded drainage.
BeC2, BlC2, BlC3, BmC	Severe: perched water table; impeded drainage.	Severe: slope	Moderate: perched water table; impeded drainage.
BlD3	Severe: perched water table; impeded drainage.	Severe: slope	Moderate: perched water table; impeded drainage.
Bibb:			
Bn, Bo, Br	Severe: high water table; flood hazard; poor drainage.	Severe: flood hazard	Severe: high water table; flood hazard; poor drainage.
Butlertown:			
BtB2	Severe: seasonally perched high water table; impeded drainage.	Moderate: moderately permeable substrata; slope.	Moderate: seasonally high water table; impeded drainage.
Chillum:			
CaB2, CbB	Moderate to severe: hard substratum.	Moderate: slope	Slight
CaC2, CaC3, CbC	Severe: hard substratum; slope.	Severe: slope	Slight
CaD2, CbE	Severe: hard substratum; slope.	Severe: slope	Moderate: slope

See footnote at end of table.

water table, natural drainage, depth to an impervious layer, steepness of slope, and the hazard of flooding.

SEWAGE LAGOONS: Permeability of the soil, depth to an impervious layer, steepness of slope, hazard of flooding, and content of organic matter.

FOUNDATIONS FOR HOMES OF TWO STORIES OR LESS: Depth to water table, natural drainage, steepness of slope, depth to bedrock (assuming a 6-foot basement), hazard of flooding, shrink-swell properties, and stability. For industrial or commercial buildings and homes of more than two stories, investigation should be made at each site.

LANDSCAPING AND EARTH MOVEMENT: Texture of the surface soil and subsoil, plasticity and stability of the subsoil and substratum, wetness, height of water table, susceptibility to frost action, and limitations to working the soil when it is wet or frozen.

STREETS AND PARKING LOTS: Wetness and depth of water table, steepness of slope, hazard of flooding, depth to bedrock, and kind of bedrock.

MATERIAL FOR SANITARY LAND FILL: Texture of the soil, plasticity, content of organic matter, and thickness of available soil material.

CEMETERIES: Depth to water table, natural drainage, depth to impervious layer, plasticity and stability of the subsoil and substratum, degree of stoniness, hazard of flooding, and steepness of slope.

HOME GARDENS: Texture of the surface soil, permeability of the subsoil, steepness of slope, moisture-holding capacity, depth to water table, natural drainage, and degree of erosion.

used for community development

(Ma) are variable and are not included in this table]

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: seasonally high water table.	Moderate: seasonally wet.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: seasonally high water table.	Moderate: seasonally wet; slope.
Moderate: seasonally wet.	Severe: slope; seasonally wet.	Slight	Severe: seasonally high water table.	Severe: seasonally wet; slope.
Moderate: hard subsoil	Slight	Slight	Moderate: hard layer	Moderate: hard subsoil; slope.
Moderate: hard subsoil; slope.	Slight for streets; moderate for parking lots; slope.	Slight	Moderate: hard layer; slope.	Severe: hard subsoil; slope.
Severe: slope	Moderate to severe for streets; severe for parking lots; slope.	Slight	Moderate to severe: slope.	Severe: hard subsoil; slope.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: perched water table.	Moderate: seasonally wet.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: perched water table.	Moderate: seasonally wet; slope.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: perched water table.	Severe: seasonally wet; slope.
Moderate: seasonally wet; slope.	Severe: seasonally wet; slope.	Slight	Severe: perched water table.	Severe: seasonally wet; slope.
Severe: high water table; flood hazard; poor drainage.	Severe: high water table; flood hazard; poor drainage.	Slight	Severe: high water table; flood hazard; poor drainage.	Severe: high water table; flood hazard; poor drainage.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: seasonally high water table.	Moderate: seasonally wet; slope.
Moderate: hard substratum.	Slight for streets; moderate for parking lots.	Slight	Slight: hard substratum	Moderate: hard substratum; slope.
Moderate: hard substratum; slope.	Moderate: slope	Slight	Slight: hard substratum	Severe: hard substratum; slope.
Severe: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate: slope	Severe: hard substratum; slope.

TABLE 4.—*Limitations of soils used*

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Christiana:			
CdA, CeA	Severe: slow permeability	Slight	Severe: high shrink-swell potential; unstable.
CdB2, CeB2, CfB	Severe: slow permeability	Moderate: slope	Severe: high shrink-swell potential; unstable.
CcC3, CdC2, CeC2, CfC	Severe: unstable; slope	Severe: slope	Severe: high shrink-swell potential; unstable.
CcD3, CcE3, CdD2, Ced2, CfE	Severe: unstable; slope	Severe: slope	Severe: high shrink-swell potential; unstable; slope.
Codorus:			
Ch, Ck	Severe: high water table; flood hazard; impeded drainage.	Severe: flood hazard	Severe: high water table; flood hazard; impeded drainage.
Colemantown:			
Cl	Severe: high water table; poor drainage.	Slight	Severe: high water table; poor drainage.
Collington:			
CmA, CoA	Slight	Severe: too permeable	Slight
CmB2, CoB2, CpB, CnB2	Slight	Severe: too permeable; slope.	Slight
CmC2, CmC3, CoC3, CpC, CnC2	Slight: slope	Severe: slope	Slight
CmD2, CmD3, CnD2, SlD	Moderate: slope	Severe: slope	Moderate: slope
CmE2, CmE3, SlE (For limitations of Sassafras and Aura soils in mapping units SlD and SlE, refer to interpretations in this table for the Sassafras and Aura series, respectively.)	Severe: slope	Severe: slope	Severe: slope
Comus:			
Cr	Severe: flood hazard	Severe: flood hazard	Severe: flood hazard
Croom:			
CsB2, CtB2, CuB	Moderate: hard substratum	Moderate: slope	Slight
CsC2, CsC3, CtC2, CtC3, CuC	Severe: hard substratum; slope.	Severe: slope	Slight
AvE, CtD2, CuE (For limitations of Aura soil in mapping unit AvE, refer to interpretations in this table for the Aura series.)	Severe: slope	Severe: slope	Moderate: slope
Donlonton:			
DoA	Severe: seasonally high water table; impeded drainage.	Slight	Moderate: seasonally high water table; unstable.
DoB2	Severe: seasonally high water table; impeded drainage.	Moderate: slope	Moderate: seasonally high water table; unstable.
Elkton:			
Ek	Severe: high water table; poor drainage.	Slight	Severe: high water table; poor drainage.
ElB	Severe: high water table; poor drainage.	Moderate: slope	Severe: high water table; poor drainage.
Elsinboro:			
EmA, EnA	Slight	Moderate: moderately permeable substrata.	Slight
EmB2, EnB2, EuB	Slight	Moderate: slope	Slight
EnC2	Slight	Severe: slope	Slight
Evesboro:			
GeB, ReB, WeB2	Slight: risk of polluting nearby wells.	Severe: rapid permeability.	Slight
GeC, ReC, WeC2, WeC3	Slight: risk of polluting nearby wells.	Severe: rapid permeability.	Slight

See footnote at end of table.

for community development—Continued

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Severe: slow permeability.	Moderate: hard; sticky.
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Severe: slow permeability.	Moderate: hard; sticky; slope.
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Severe: slow permeability; hard; sticky.	Severe: hard; sticky; slope.
Severe: hard; sticky; unstable; slope.	Severe: high shrink-swell potential; unstable; slope.	Severe: sticky; unstable.	Severe: hard; sticky; unstable; slope.	Severe: hard; sticky; unstable; slope.
Severe: high water table; flood hazard; impeded drainage.	Severe: high water table; flood hazard; impeded drainage.	Slight	Severe: high water table; flood hazard; impeded drainage.	Moderate: impeded drainage; flood hazard.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Severe: sticky	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight: slope	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate	Severe: slope.
Severe: slope	Severe: slope	Slight	Severe: slope	Severe: slope.
Slight: flood hazard	Severe: flood hazard	Slight	Severe: flood hazard	Slight: flood hazard.
Moderate: hard subsoil	Slight: slope	Slight	Severe: moderate; hard subsoil.	Moderate: hard subsoil; slope.
Moderate: hard subsoil; slope.	Slight for streets; moderate for parking lots; slope.	Slight	Severe: moderate; hard subsoil.	Severe: hard subsoil; slope.
Severe: slope	Moderate to severe for streets; severe for parking lots; slope.	Slight	Severe: slope	Severe: hard subsoil; slope.
Moderate: sticky; seasonally wet.	Moderate: seasonally wet	Severe: sticky; unstable.	Severe: sticky; seasonally high water table.	Moderate: seasonally wet.
Moderate: seasonally wet; sticky.	Moderate: seasonally wet	Severe: sticky; unstable.	Severe: sticky; seasonally high water table.	Moderate: seasonally wet; slope.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Severe: sticky	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Severe: sticky	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Slight	Slight	Severe: moderately slow permeability.	Slight	Slight.
Slight	Slight	Severe: moderately slow permeability.	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Severe: moderately slow permeability.	Slight	Severe: slope.
Slight	Slight: loose; difficult to compact.	Moderate: loose; difficult to compact.	Moderate: droughty	Severe: droughty; low fertility.
Slight	Slight for streets; moderate for parking lots; loose; slope.	Moderate: loose; difficult to compact.	Moderate: droughty	Very severe: droughty; low fertility; slope.

TABLE 4.—*Limitations of soils used*

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Evesboro—Continued			
ReD, WeD3 (For limitations of Galestown soils in mapping units GeB and GeC; for Rumford soils in units ReB, ReC, and ReD; and for Westphalia soils in units WeB2, WeC2, WeC3, and WeD3, refer to interpretations in this table for the Galestown, Rumford, and Westphalia series, respectively.)	Moderate: slope; risk of polluting nearby wells.	Severe: rapid permeability.	Moderate: slope; loose; difficult to compact.
Fallsington:			
Fl, Fs, Fu	Severe: high water table; poor drainage.	Severe	Severe: high water table; poor drainage.
Galestown:			
GaB, GdB, GeB, GmB	Slight: risk of polluting nearby wells.	Severe: rapid permeability.	Moderate: loose; difficult to compact.
GaC, GdC, GeC, GmC (For limitations of Evesboro soil in mapping units GeB and GeC, refer to interpretations in this table for the Evesboro series.)	Moderate: slope; risk of polluting nearby wells.	Severe: rapid permeability.	Moderate: loose; difficult to compact.
Glenelg:			
GoB	Slight	Severe: slope	Slight
GnC2	Moderate: slope	Severe: slope	Moderate: slope
Hatboro:			
Ha	Severe: high water table; flood hazard; poor drainage.	Severe: flood hazard	Severe: high water table; flood hazard; poor drainage.
Howell:			
HoB2, HwB2	Severe: slowly permeable	Moderate: slope	Moderate: high shrink-swell potential.
HcC3, HoC2, HwC2	Severe: slowly permeable	Severe: slope	Moderate: shrinkage
HcD3, HwD2	Severe: slow permeability; slope.	Severe: slope	Severe: slope; high shrink-swell potential.
HwE2	Severe: slow permeability; slope.	Severe: slope	Severe: slope; high shrink-swell potential.
Hyde:			
Hy	Severe: high water table; ponding; very poor drainage.	Severe: too highly organic.	Severe: high water table; very poor drainage.
Iuka:			
Ik, In, Iu	Severe: high water table; flood hazard; impeded drainage.	Severe: flood hazard	Severe: high water table; flood hazard; impeded drainage.
ImA, IoA, Ix	Severe: high water table; impeded drainage.	Moderate: moderate permeability.	Moderate: high water table; impeded drainage.
ImB, IoB	Severe: high water table; impeded drainage.	Moderate: slope	Moderate: high water table; impeded drainage.
Johnston:			
Jo, Ju	Severe: high water table; flood hazard; very poor drainage.	Severe: too highly organic; flood hazard.	Severe: high water table; flood hazard; very poor drainage.

See footnote at end of table.

for community development—Continued

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Moderate: slope	Severe: loose; slope	Moderate: loose; difficult to compact.	Severe: slope	Very severe: droughty; low fertility; slope.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Slight	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Severe	Moderate: loose; difficult to compact.	Moderate: loose; difficult to compact.	Moderate: droughty	Severe: droughty; low fertility.
Severe	Severe: loose; slope	Moderate: loose; difficult to compact.	Moderate: droughty	Very severe: droughty; low fertility; slope.
Slight	Moderate: slope	Slight	Slight	Moderate: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Slight	Severe: slope.
Severe: high water table; flood hazard; poor drainage.	Severe: high water table; flood hazard; poor drainage.	Slight	Severe: high water table; flood hazard; poor drainage.	Severe: high water table; flood hazard; poor drainage.
Moderate: hard; sticky.	Slight	Moderate: sticky	Moderate: hard; sticky.	Moderate: slope.
Moderate: hard; sticky.	Slight for streets; moderate for parking lots; high shrink-swell potential; slope.	Moderate: sticky	Moderate: hard; sticky.	Severe: slope.
Moderate: hard; sticky; slope.	Moderate for streets; severe for parking lots; high shrink-swell potential; slope.	Moderate: sticky	Moderate: slope	Severe: slope.
Severe: slope; hard; sticky.	Severe: slope; high shrink-swell potential.	Moderate: sticky	Severe: slope; hard; sticky.	Severe: slope.
Severe: high water table; very poor drainage.	Severe: high water table: ponding; very poor drainage.	Severe: sticky; too highly organic.	Severe: high water table; ponding; very poor drainage.	Severe: high water table; ponding; very poor drainage.
Severe: high water table; flood hazard; impeded drainage.	Severe: high water table; flood hazard; impeded drainage.	Slight	Severe: high water table; flood hazard; impeded drainage.	Moderate: impeded drainage; flood hazard.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Moderate: high water table; impeded drainage.	Moderate: impeded drainage.
Moderate: seasonally wet.	Moderate: seasonally wet; slope.	Slight	Moderate: high water table; impeded drainage.	Moderate: impeded drainage; slope.
Severe: high water table; flood hazard; very poor drainage.	Severe: high water table; flood hazard; very poor drainage.	Severe: too highly organic.	Severe: high water table; flood hazard; very poor drainage.	Severe: high water table; flood hazard; very poor drainage.

TABLE 4.—*Limitations of soils used*

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Keyport:			
KeA, KpA	Severe: seasonally high water table; impeded drainage.	Slight	Moderate: seasonally high water table; unstable.
KeB2, KpB2, KuB	Severe: seasonally high water table; impeded drainage.	Moderate: slope	Moderate: seasonally high water table; unstable.
KeC2, KpC2, KrC3	Severe: seasonally high water table; impeded drainage.	Severe: slope	Moderate: seasonally high water table; unstable.
Klej:			
Ky	Severe: seasonally high water table; impeded drainage.	Severe: rapid permeability.	Moderate: seasonally high water table.
Leonardtown:			
LeA	Severe: perched water table; poor drainage.	Slight	Severe: perched water table; poor drainage.
LeB	Severe: perched water table; poor drainage.	Moderate: slope	Severe: perched water table; poor drainage.
Magnolia:			
MfB2, MgB2	Moderate: moderately slow permeability.	Moderate: slope	Slight
MgC2	Moderate: moderately slow permeability.	Severe: slope	Slight
Manor:			
MhB2	Slight	Severe: rapid permeability; slope.	Slight
MhC2, MkC	Moderate: slope	Severe: slope; rapid permeability.	Moderate: slope
MhD2, MhF2	Severe: slope	Severe: rapid permeability; slope.	Moderate to severe: slope
Marr:			
MlA	Slight	Slight	Slight
MlB2, MlB3	Slight	Moderate: slope	Slight
MlC2, MlC3	Moderate: slope	Severe: slope	Slight
MlD3	Severe: slope	Severe: slope	Moderate: slope
MlE	Severe: slope	Severe: slope	Severe: slope
Matapeake:			
MmA, MnA	Moderate: moderate to moderately slow permeability.	Moderate: moderate to moderately slow permeability.[1]	Slight
MmB2, MnB2, MoB2, MpB	Moderate: moderate to moderately slow permeability.	Moderate: moderate to moderately slow permeability; slope.	Slight
MnC2, MnC3, MpC	Moderate: moderate to moderately slow permeability; slope.	Severe: moderate to moderately slow permeability; slope.	Slight
MnD2	Severe: moderate to moderately slow permeability; slope.	Severe: moderate to moderately slow permeability; slope.	Moderate: slope
Matawan:			
MrA, MsA	Severe: seasonally high water table; impeded drainage.	Slight	Moderate: seasonally high water table; impeded drainage.
MrB2, MsB	Severe: seasonally high water table; impeded drainage.	Moderate: slope	Moderate: seasonally high water table; impeded drainage.
MrC2	Severe: seasonally high water table; impeded drainage.	Severe: slope	Moderate: seasonally high water table; impeded drainage.
Mattapex:			
MtA, MuA	Severe: seasonally high water table; impeded drainage.	Slight	Moderate: seasonally high water table; impeded drainage.
MtB2, MuB2, MvB	Severe: seasonally high water table; impeded drainage.	Moderate: slope	Moderate: seasonally high water table; impeded drainage.

See footnote at end of table.

for community development—Continued

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Moderate: sticky; seasonally wet.	Moderate: seasonally wet	Severe: sticky; unstable.	Severe: sticky; seasonally high water table.	Moderate: seasonally wet.
Moderate: sticky; seasonally wet.	Moderate: seasonally wet	Severe: sticky; unstable.	Severe: sticky; seasonally high water table.	Moderate: seasonally wet; slope.
Severe: sticky; seasonally wet; slope.	Moderate for streets; severe for parking lots; seasonally wet; slope.	Severe: sticky; unstable.	Severe: sticky; seasonally high water table.	Severe: seasonally wet; slope.
Moderate: seasonally high water table.	Moderate: seasonally wet; loose.	Moderate: loose; difficult to compact.	Moderate: seasonally high water table.	Severe: seasonally high water table; low fertility.
Severe: perched water table; poor drainage.	Severe: perched water table; poor drainage.	Moderate: sticky	Severe: perched water table; poor drainage.	Severe: perched water table; poor drainage.
Severe: perched water table; poor drainage.	Severe: perched water table; poor drainage.	Moderate: sticky	Severe: perched water table; poor drainage.	Severe: perched water table; poor drainage.
Moderate: hard; sticky	Slight	Moderate: sticky	Slight	Moderate: slope.
Moderate: hard; sticky	Slight for streets; moderate for parking lots; slope.	Moderate: sticky	Slight	Severe: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Moderate: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate: slope	Severe: slope.
Severe: slope	Severe: slope	Slight	Severe: slope	Severe: slope.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Slight	Severe: slope.
Severe: slope	Severe: slope	Slight	Severe: slope	Severe: slope.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight: slope	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate: slope	Severe: slope.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: slow permeability.	Moderate: seasonally wet.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: slow permeability.	Moderate: seasonally wet; slope.
Moderate: seasonally wet; slope.	Moderate: seasonally wet; slope.	Slight	Severe: slow permeability.	Severe: seasonally wet; slope.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: seasonally high water table.	Moderate: seasonally wet.
Moderate: seasonally wet.	Moderate: seasonally wet	Slight	Severe: seasonally high water table.	Moderate: seasonally wet; slope.

TABLE 4.—*Limitations of soils used*

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Mixed alluvial land:			
Mw	Severe: high water table; flooding.	Severe: flooding	Severe: high water table; flooding.
Monmouth:			
MyA	Severe: moderately slow permeability.	Slight	Slight
MyB2	Severe: moderately slow permeability.	Moderate: slope	Slight
MyC2, MxC3	Severe: moderately slow permeability.	Severe: slope	Slight
MyD2, MxD3	Severe: moderately slow permeability.	Severe: slope	Moderate: slope
Muirkirk:			
MzB2	Severe: slow permeability in subsoil.	Moderate: slope	Severe: high shrink-swell potential; unstable.
MzC2	Severe: slow permeability in subsoil.	Severe: slope	Severe: high shrink-swell potential; unstable.
Ochlockonee:			
OcA, OhA, Ok	Slight	Moderate: moderate permeability.	Slight
OcB, OhB	Slight	Moderate: slope	Slight
OcC	Slight	Severe: slope	Slight
Othello:			
Ol, Ot	Severe: high water table; poor drainage.	Severe: rapid permeability in substratum.	Severe: high water table; poor drainage.
Plummer:			
Pr (For limitations of Rutlege soils in mapping unit Pr, refer to interpretations in this table for the Rutlege series.)	Severe: high water table; poor drainage.	Severe: rapid permeability.	Severe; high water table; poor drainage.
Rumford:			
RdA	Slight	Severe: rapid permeability in substratum. [1]	Slight
RdB2, ReB	Slight	Severe: rapid permeability in substratum.	Slight
RdC2, RdC3, ReC	Slight	Severe: slope	Slight
RdD2, ReD (For limitations of Evesboro soils in mapping units ReB, ReC, and ReD, refer to interpretations in this table for the Evesboro series.)	Moderate: slope	Severe: slope	Moderate: slope
Rutlege:			
Pr (For limitations of Plummer soils in mapping unit Pr, refer to interpretations in this table for the Plummer series.)	Severe: water table; very poor drainage.	Severe: rapid permeability; too organic.	Severe: water table; very poor drainage.
Sandy land, steep:			
SaE	Severe: slope; risk of polluted nearby wells.	Severe: rapid permeability; slope.	Severe: slope
Sandy and clayey land:			
ScB	Severe: slow permeability	Moderate: slope	Severe: high shrink-swell potential; unstable.

See footnote at end of table.

for community development—Continued

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Severe: high water table; flooding.	Severe: high water table; flooding.	Slight	Severe: high water table; flooding.	Severe: high water table; flooding.
Moderate: hard; sticky	Slight	Moderate: sticky	Moderate: moderately slow permeability.	Slight.
Moderate: hard; sticky	Slight	Moderate: sticky	Moderate: moderately slow permeability.	Moderate: slope.
Moderate: hard; sticky	Slight for streets; moderate for parking lots; slope.	Moderate: sticky	Moderate: moderately slow permeability.	Severe: slope.
Moderate: hard; sticky; slope.	Moderate for streets; severe for parking lots; slope.	Moderate: sticky	Moderate: moderately slow permeability.	Severe: slope.
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Moderate: hard; sticky.	Severe: slow permeability.
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Moderate: hard; sticky.	Severe: slow permeability.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Moderate: sticky	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Moderate: loose; difficult to compact.	Severe: high water table; poor drainage.	Severe: high water table; poor drainage; very low fertility.
Slight	Slight	Slight	Slight	Moderate: somewhat droughty.
Slight	Slight	Slight	Slight	Moderate: somewhat droughty; slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: droughty; slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate: slope	Severe: droughty; slope.
Severe: water table; very poor drainage.	Severe: water table; very poor drainage.	Severe: loose; too organic.	Severe: water table; very poor drainage.	Very severe: water table; very poor drainage; very low fertility.
Severe: slope	Severe: slope	Moderate: loose; difficult to compact.	Severe: slope	Severe: droughty; low fertility; slope.
Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable.	Severe: hard; slow permeability.	Severe: droughty; low fertility; slope.

TABLE 4.—*Limitations of soils used*

Soil series and map symbols	Degree and kind of limitation for—		
	Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less
Sandy and clayey land—Continued			
ScC	Severe: slope; unstable	Severe: slope	Severe: high shrink-swell potential; unstable.
ScD	Severe: slope; unstable	Severe: slope	Severe: high shrink-swell potential; unstable.
Sassafras:			
ShA	Slight	Severe: rapid permeability.	Slight
SfB2, SgB2, ShB2, SkB	Slight	Severe: rapid permeability; slope.	Slight
SfC2, SgC2, SgC3, ShC2, ShC3, SkC	Moderate: slope	Severe: rapid permeability; slope.	Slight
SfD2, SgD2, SgD3, SlD	Moderate: slope	Severe: slope; rapid permeability.	Moderate: slope
SgE, SkE, SlE (For limitations of Aura and Collington soils in mapping units SlD and SlE, refer to interpretations in this table for the Aura and Collington series, respectively.)	Severe: slope	Severe: slope; rapid permeability.	Severe: slope
Shrewsbury:			
SmA, SnA, So	Severe: high water table; poor drainage.	Slight to moderate: moderate permeability in substratum.	Severe: high water table; poor drainage.
SmB	Severe: high water table; poor drainage.	Moderate: slope	Severe: high water table; poor drainage.
Silty and clayey land:			
SpB	Severe: slow permeability	Moderate: slope	Severe: high shrink-swell potential; unstable.
SpC	Severe: slope; unstable	Severe: slope	Severe: high shrink-swell potential; unstable.
SpE	Severe: slope; unstable	Severe: slope	Severe: high shrink-swell potential; unstable.
Sunnyside:			
StB2, SuB2, SwB	Slight	Moderate to severe: moderately rapid permeability in substratum.[1]	Slight
StC2, SuC2, SvC3, SwC	Slight	Severe: slope	Slight
StD2, SuD2, SvD3, StE	Moderate: slope	Severe: slope	Moderate: slope
Swamp:			
Sx	Severe: ponded	Severe: highly variable material; ponded.	Severe: ponded
Tidal marsh:			
Tm	Severe: tidal flooding	Severe: tidal flooding	Severe: tidal flooding
Westphalia:			
WaA	Slight	Severe: rapid permeability.[1]	Slight
WaB2, WaB3, WbB2, WeB2	Slight	Severe: rapid permeability.	Slight
WaC2, WaC3, WbC2, WeC2, WeC3	Moderate: slope	Severe: slope	Slight
WaD2, WaD3, WbD2, WeD3 (For limitations of Evesboro soils in mapping units WeB2, WeC2, WeC3, and WeD3, refer to interpretations in this table for the Evesboro series.)	Moderate to severe: slope	Severe: slope	Moderate: slope
Woodstown:			
WoA, Wu	Severe: seasonally high water table; impeded drainage.	Severe: moderate to rapid permeability.[1]	Moderate: seasonally high water table.
WoB2	Severe: seasonally high water table; impeded drainage.	Severe: moderate to rapid permeability.	Moderate: seasonally high water table.
WoC2	Severe: seasonally high water table; impeded drainage.	Severe: moderate to rapid permeability; slope.	Moderate: seasonally high water table.

[1] Refers to substratum beneath the solum; where sewage lagoon floors are constructed of SC material of the subsoil, the limitation because of permeability is only slight.

for community development—Continued

Degree and kind of limitation for—Continued				
Landscaping and earth movement	Streets and parking lots	Material for sanitary land fill	Cemeteries	Home gardens
Severe: hard; sticky; unstable. Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable. Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable. Severe: sticky; unstable.	Severe: hard; slow permeability. Severe: hard; sticky; slope; unstable.	Severe: droughty; low fertility; slope. Severe: droughty; low fertility; slope.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate: slope	Severe: slope.
Severe: slope	Severe: slope	Slight	Severe: slope	Severe: slope.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Slight	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Severe: high water table; poor drainage.	Severe: high water table; poor drainage.	Slight	Severe: high water table; poor drainage.	Severe: high water table; poor drainage.
Severe: hard; sticky; unstable. Severe: hard; sticky; unstable. Severe: hard; sticky; unstable.	Severe: high shrink-swell potential; unstable. Severe: high shrink-swell potential; unstable. Severe: high shrink-swell potential; unstable.	Severe: sticky; unstable. Severe: sticky; unstable. Severe: sticky; unstable.	Severe: slow permeability. Severe: slow permeability. Severe: hard; sticky; slope; unstable.	Severe: droughty; low fertility; slope. Severe: droughty; low fertility; slope. Very severe: droughty; low fertility; slope.
Slight	Slight	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Slight	Severe: slope.
Severe: ponded	Severe: ponded	Severe: highly variable material.	Severe: ponded	Severe: ponded.
Severe: tidal flooding	Severe: tidal flooding	Severe: highly variable material.	Severe: tidal flooding	Severe: tidal flooding.
Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Moderate: slope.
Slight	Slight for streets; moderate for parking lots; slope.	Slight	Slight	Severe: slope.
Moderate: slope	Moderate for streets; severe for parking lots; slope.	Slight	Moderate	Severe: slope.
Moderate: seasonally wet. Moderate: seasonally wet. Moderate: seasonally wet.	Moderate: seasonally wet Moderate: seasonally wet Moderate: slope; seasonally wet.	Slight Slight Slight	Moderate: seasonally high water table. Moderate: seasonally high water table. Moderate: seasonally high water table.	Moderate: seasonally wet. Moderate: seasonally wet; slope. Severe: seasonally wet; slope.

Uses of soils for recreational facilities

In the eastern part of the United States, the most common outdoor recreational activities that are influenced by soils and by landforms probably are hunting, fishing, picnicking, hiking, camping, and athletic contests. Hunting and fishing are discussed in the subsection "Wildlife."

Facilities of outdoor recreation that depend a great deal on soil properties are paths and trails for hiking, studying nature, or viewing scenery; picnic and play areas where foot traffic is not normally heavy; athletic fields (baseball diamonds, football fields, volleyball courts) and other intensive play areas where foot traffic is heavy; campsites, including tent sites and accompanying facilities for outdoor living; and seasonal and year-round cottages, washrooms, bathhouses, picnic shelters, and service buildings.

Table 5 rates the degree and lists the kind of limitation of each soil in Prince Georges County for specified recreational uses. The limitations are rated *slight*, *moderate*, and *severe*. These ratings were made on the basis of depth to the water table, wetness and natural drainage, hazard of flooding, permeability, texture (including gravel and stones), steepness of slopes, and stability.

TABLE 5.—*Limitations of soils for recreational uses*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made land (Ma) were not included, because they are too variable]

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Adelphia:					
AdA, AdB2	Moderate: seasonally high water table.	Slight	Moderate: seasonally wet.	Slight	Moderate: seasonally wet.
AdC2	Moderate: seasonally high water table.	Slight	Severe: slope	Slight	Moderate: seasonally wet; slope.
AhA, AhB2	Moderate: seasonally high water table.	Moderate: silty	Moderate: silty; seasonally wet.	Slight	Moderate: silty; seasonally wet.
Aura:					
AuB2	Slight	Slight	Moderate: gravelly.	Slight	Moderate: gravelly.
AuC2, AuC3	Moderate: slope	Slight	Moderate to severe: slope; gravelly.	Moderate	Moderate: slope; gravelly.
AuD, SlD	Moderate: slope	Moderate: slope	Severe: slope; gravelly.	Moderate: slope	Severe: slope; gravelly.
AvE, SlE	Severe: slope	Severe: slope	Severe: slope; gravelly.	Severe: slope	Severe: slope; gravelly.
(For limitations of Croom soil in mapping unit AvE, and those of Sassafras and Collington soils in units SlD and SlE, refer to interpretations in this table for Croom, Sassafras, and Collington series, respectively.)					
Beltsville:					
BeA, BeB2	Moderate: seasonally high water table.	Slight	Severe: very slow permeability.	Slight	Severe: very slow permeability.
BeC2	Moderate: seasonally high water table.	Slight	Severe: very slow permeability.	Moderate: slope	Severe: very slow permeability.
BlA, BmB, BlB2	Moderate: seasonally high water table.	Moderate: silty	Severe: very slow permeability.	Slight	Severe: very slow permeability.
BlC2, BlC3, BlD3; BmC	Moderate: slope; seasonally high water table.	Moderate: silty	Severe: slope; very slow permeability.	Moderate: slope	Severe: very slow permeability.
Bibb:					
Bn, Bo, Br	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Butlertown:					
BtB2	Slight	Moderate: silty	Moderate: silty; moderately slow permeability.	Slight	Moderate: silty; moderately slow permeability.
Chillum:					
CaB2, CbB	Slight	Moderate: silty	Moderate: silty; slope.	Slight	Moderate: silty.
CaC2, CaC3, CaD2, CbC, CbE	Moderate: slope	Moderate: silty	Severe: slope	Slight	Moderate: silty; slope.
Christiana:					
CcC3, CcD3	Moderate: unstable; slope.	Severe: clayey surface.	Severe: clayey surface.	Severe: clayey surface.	Severe: clayey surface.
CcE3	Severe: slope; unstable.	Severe: clayey surface.	Severe: clayey surface.	Severe: clayey surface.	Severe: clayey surface.
CdA, CdB2	Moderate: unstable.	Slight	Moderate: slow permeability.	Slight	Moderate: slow permeability.
CdC2	Moderate: unstable; slope.	Slight	Severe: slope	Slight	Moderate: slow permeability.
CdD2	Moderate: unstable; slope.	Moderate: slope	Severe: slope	Slight	Moderate: slow permeability.
CeA, CeB2, CfB	Moderate: unstable.	Moderate: silty	Moderate: silty; slow permeability.	Slight	Severe: silty; slow permeability.
CeC2, CeD2, CfC	Moderate: unstable; slope.	Moderate: silty	Severe: slope	Slight	Moderate to severe: silty; slow permeability.
CfE	Severe: unstable; slope.	Severe: silty; slope.	Severe: slope	Moderate: slope	Severe: silty; slope.
Codorus:					
Ch. Ck	Severe: flood hazard; impeded drainage.	Moderate: silty; flood hazard.	Severe: flood hazard; impeded drainage.	Moderate: flood hazard.	Severe: flood hazard; impeded drainage.
Colemantown:					
Cl	Severe: high water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage; very slow permeability.	Severe: high water table; poor drainage.	Severe: poor drainage; very slow permeability.
Collington:					
CmA	Slight	Slight	Slight	Slight	Slight.
CmB2, CpB	Slight	Slight	Moderate: slope	Slight	Slight.
CmC2, CmC3, CmD2, CmD3, CpC, SlD.	Moderate: slope	Slight	Severe: slope	Slight	Moderate: slope.
CmE2, CmE3, SlE	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope.
CnB2	Slight	Moderate: loamy sand.	Moderate: slope	Slight	Slight.
CnC2, CnD2	Moderate: slope	Moderate: loamy sand.	Severe: slope	Slight	Moderate: slope.
CoA	Slight	Moderate: silty	Moderate: silty	Slight	Moderate: silty.
CoB2	Slight	Moderate: silty	Moderate: silty; slope.	Slight	Moderate: silty.
CoC3 (For limitations of Sassafras and Aura soils in mapping units SlD and SlE, refer to interpretations in this table for Sassafras and Aura series, respectively.)	Moderate: slope	Moderate: silty	Severe: slope	Slight	Moderate: silty; slope.
Comus:					
Cr	Severe: flood hazard.	Moderate: silty; flood hazard.	Severe: flood hazard.	Moderate: flood hazard.	Severe: flood hazard.
Croom:					
CsB2, CtB2, CuB	Slight	Slight	Moderate: gravelly.	Slight	Moderate: gravelly.
CsC2, CsC3, CtC2, CtC3, CuC	Moderate: slope	Slight	Severe: slope; gravelly.	Slight	Moderate: slope; gravelly.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Croom—Continued					
CtD2	Severe: slope	Moderate: slope	Severe: slope; gravelly.	Moderate: slope	Severe: slope; gravelly.
AvE, CuE (For limitations of Aura soil in mapping unit AvE, refer to interpretations in this table for the Aura series.)	Severe: slope	Severe: slope	Severe: slope; gravelly.	Moderate: slope	Severe: slope; gravelly.
Donlonton:					
DoA, DoB2	Moderate: seasonally high water table.	Slight	Severe: very slow permeability.	Slight	Severe: very slow permeability.
Elkton:					
Ek, ElB	Severe: high water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage; very slow permeability.	Severe: high water table; poor drainage.	Severe: poor drainage; very slow permeability.
Elsinboro:					
EmA, EnA	Slight	Slight	Slight	Slight	Slight.
EmB2, EnB2, EuB	Slight	Slight	Moderate: slope	Slight	Slight.
EnC2	Moderate: slope	Slight	Severe: slope	Moderate	Moderate: slope
Evesboro:					
GeB, ReB, WeB2	Slight	Moderate: loamy sand.	Moderate: loamy sand; difficult to sod.	Moderate: loose; difficult to sod.	Moderate: loamy sand.
GeC, ReC, ReD, WeC2, WeC3, WeD3. (For limitations of Galestown soils in mapping units GeB and GeC; for Rumford soils in units ReB, ReC, and ReD; and for Westphalia soils in units WeB2, WeC2, WeC3, and WeD3, refer to interpretations in this table for Galestown, Rumford, and Westphalia series, respectively.)	Moderate: slope	Moderate: loamy sand.	Severe: slope	Moderate: loose; difficult to sod.	Moderate: loamy sand.
Fallsington:					
Fl, Fs, Fu	Severe: high water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage.	Severe: high water table; poor drainage.	Severe: poor drainage.
Galestown:					
GaB	Slight	Moderate: loamy sand.	Severe: gravelly loamy sand.	Moderate: loose; difficult to sod.	Moderate: loamy sand; gravelly.
GaC	Moderate: slope	Moderate: loamy sand.	Severe: slope; gravelly loamy sand.	Moderate: loose; difficult to sod.	Moderate: loamy sand; gravelly.
GdB, GeB, GmB	Slight	Moderate: loamy sand.	Moderate: loamy sand; difficult to sod.	Moderate: loose; difficult to sod.	Moderate: loamy sand.
GdC, GeC, GmC (For limitations of Evesboro soil in mapping units GeB and GeC, refer to interpretations in this table for Evesboro series.)	Moderate: slope	Moderate: loamy sand.	Severe: slope	Moderate: loose; difficult to sod.	Moderate: loamy sand.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Glenelg:					
GnC2	Moderate: slope	Slight	Severe: slope	Moderate	Moderate: slope.
GoB	Slight	Slight	Moderate: slope	Slight	Slight.
Hatboro:					
Ha	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.	Severe: flood hazard; poor drainage.
Howell:					
HoB2	Slight	Slight	Moderate: slope; moderately slow permeability.	Slight	Moderate: moderately slow permeability.
HoC2	Moderate: slope	Slight	Severe: slope	Moderate	Moderate: slope; moderately slow permeability.
HwB2	Slight	Moderate: silty	Moderate: silty; moderately slow permeability; slope.	Slight	Moderate: silty; moderately slow permeability.
HwC2, HcC3, HcD3, HwD2	Moderate: slope	Moderate: silty or sticky.	Severe: slope	Moderate	Moderate: silty or sticky; slope.
HwE2	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Hyde:					
Hy	Severe: high water table; very poor drainage.	Severe: organic surface; very poor drainage.	Severe: organic surface; very poor drainage.	Severe: organic surface; high water table; very poor drainage.	Severe: organic surface; very poor drainage.
Iuka:					
Ik	Severe: flood hazard; impeded drainage.	Moderate: flood hazard.	Severe: flood hazard; impeded drainage.	Moderate: flood hazard.	Severe: flood hazard; impeded drainage.
ImA, ImB	Moderate: seasonally high water table.	Slight	Moderate: seasonally wet.	Moderate: seasonally wet.	Moderate: seasonally wet.
In, Iu	Severe: flood hazard; impeded drainage.	Moderate: flood hazard; silty.	Severe: flood hazard; impeded drainage.	Moderate: flood hazard.	Severe: flood hazard; impeded drainage.
IoA, IoB, Ix	Moderate: seasonally high water table.	Moderate: silty	Moderate: silty; seasonally wet.	Moderate: seasonally wet.	Moderate: silty; seasonally wet.
Johnston:					
Jo, Ju	Severe: flood hazard; very poor drainage.	Severe: flood hazard; organic surface; very poor drainage.	Severe: flood hazard; organic surface; very poor drainage.	Severe: flood hazard; organic surface; very poor drainage.	Severe: flood hazard; organic surface; very poor drainage.
Keyport:					
KeA, KeB2	Moderate: seasonally high water table.	Slight	Severe: very slow permeability.	Slight	Severe: very slow permeability.
KeC2	Moderate: slope; seasonally high water table.	Slight	Severe: slope; very slow permeability.	Slight	Severe: very slow permeability.
KpA, KpB2, KuB	Moderate: seasonally high water table.	Moderate: silty	Severe: very slow permeability.	Slight	Severe: very slow permeability.
KpC2, KrC3	Moderate: slope; seasonally high water table.	Moderate: silty or sticky.	Severe: slope; very slow permeability.	Moderate: seasonally wet.	Severe: very slow permeability.
Klej:					
Ky	Moderate: seasonally high water table.	Moderate: loamy sand.	Moderate: loamy sand.	Moderate: loamy sand.	Moderate: loamy sand; seasonally high water table.
Leonardtown:					
LeA, LeB	Severe: perched water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage; very slow permeability.	Severe: perched water table; poor drainage.	Severe: poor drainage; very slow permeability.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Magnolia:					
MfB2	Slight	Slight	Moderate: slope; moderately slow permeability.	Slight	Moderate: moderately slow permeability.
MgB2	Slight	Moderate: silty	Moderate: silty; moderately slow permeability; slope.	Slight	Moderate: silty; moderately slow permeability.
MgC2	Moderate: slope	Moderate: silty	Severe: slope	Slight	Moderate: silty; slope; moderately slow permeability.
Manor:					
MhB2	Slight	Slight	Moderate: slope	Slight	Slight.
MhC2, MkC	Moderate: slope	Moderate: slope	Severe: slope	Moderate	Moderate: slope.
MhD2, MhF2	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Marr:					
MlA	Slight	Slight	Slight	Slight	Slight.
MlB2, MlB3	Slight	Slight	Moderate: slope	Slight	Slight.
MlC2, MlC3, MlD3	Moderate: slope	Slight	Severe: slope	Moderate: slope	Moderate: slope.
MlE	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Matapeake:					
MmA	Slight	Slight	Slight	Slight	Slight.
MmB2	Slight	Slight	Slight: slope	Slight	Slight.
MnA	Slight	Moderate: silty	Slight: silty	Slight	Slight.
MnB2, MoB2, MpB	Slight	Moderate: silty	Slight	Slight	Slight to moderate.
MnC2, MnC3, MnD2, MpC	Moderate: slope	Moderate: silty	Moderate to severe: slope.	Slight to moderate: slope.	Moderate: silty; slope.
Matawan:					
MrA, MrB2	Moderate: seasonally high water table.	Slight	Moderate: moderately slow permeability; slope.	Slight	Moderate: moderately slow permeability.
MrC2	Moderate: seasonally high water table.	Slight	Moderate: moderately slow permeability; slope.	Slight	Moderate: moderately slow permeability; slope.
MsA, MsB	Moderate: seasonally high water table.	Moderate: loamy sand surface.	Moderate: moderately slow permeability; loamy sand.	Moderate: loamy sand.	Moderate: moderately slow permeability; loamy sand.
Mattapex:					
MtA, MtB2	Moderate: seasonally high water table.	Slight	Moderate: moderately slow permeability.	Slight	Moderate: moderately slow permeability.
MuA, MuB2, MvB	Moderate: seasonally high water table.	Moderate: silty	Moderate: silty; moderately slow permeability.	Slight	Moderate: silty; moderately slow permeability.
Mixed alluvial land:					
Mw	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.
Monmouth:					
MyA, MyB2	Slight	Slight	Moderate: moderately slow permeability; slope.	Slight	Moderate: moderately slow permeability.
MyC2, MyD2	Moderate: slope	Slight	Severe: slope	Moderate	Moderate: slope; moderately slow permeability.
MxC3, MxD3	Moderate: slope	Moderate: sticky	Severe: sticky; slope.	Moderate to severe; slope.	Moderate to severe; sticky; slope; moderately slow permeability.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Muirkirk:					
MzB2	Slight	Moderate: loamy sand.	Moderate: slope	Slight	Slight.
MzC2	Moderate: slope	Moderate: loamy sand.	Severe: slope	Slight	Moderate: slope.
Ochlockonee:					
OcA, Ok	Slight	Slight	Slight	Slight	Slight.
OcB	Slight	Slight	Slight: slope	Slight	Slight.
OcC	Moderate: slope	Slight	Moderate: slope	Slight	Moderate: slope.
OhA	Slight	Moderate: silty	Slight	Slight	Slight.
OhB	Slight	Moderate: silty	Slight	Slight	Slight.
Othello:					
Ol, Ot	Severe: high water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage.	Severe: high water table; poor drainage.	Severe; poor drainage.
Plummer:					
Pr (For limitations of Rutlege soil in mapping unit Pr, refer to interpretations in this table for the Rutlege series.)	Severe: high water table; poor drainage.	Severe: poor drainage; loose.	Severe: poor drainage; loose.	Severe: high water table; poor drainage.	Severe: poor drainage; loose.
Rumford:					
RdA, RdB2, ReB	Slight	Moderate: loamy sand surface.	Moderate: loamy sand; slope.	Slight	Slight.
RdC2, RdC3, RdD2, ReC, ReD (For limitations of Evesboro soils in mapping units ReB, ReC, and ReD, refer to interpretations in this table for the Evesboro series.)	Moderate: slope	Moderate: loamy sand.	Moderate to severe: slope; loamy sand.	Slight	Moderate: slope.
Rutlege:					
Pr (For limitations of Plummer soils in mapping unit Pr, refer to interpretations in this table for the Plummer series.)	Severe: high water table; very poor drainage.	Severe: very poor drainage; organic surface; loose.	Severe: very poor drainage; organic surface; loose.	Severe: high water table; very poor drainage; organic surface.	Severe: very poor drainage; organic surface; loose.
Sandy land:					
SaE	Severe: slope	Severe: sandy; slope.	Severe: sandy; slope.	Severe: sandy; slope.	Severe: sandy; slope.
Sandy and clayey land:					
ScB	Moderate: unstable.	Moderate: sandy	Moderate: slope; slow permeability.	Slight	Moderate: slow permeability.
ScC	Moderate: unstable; slope.	Moderate: sandy	Severe: slope	Moderate: slope	Moderate: slope; slow permeability.
ScD	Severe: unstable; slope.	Moderate: slope; sandy.	Severe: slope	Moderate: slope	Moderate: slope; slow permeability.
Sassafras:					
SfB2, SgB2	Slight	Slight	Moderate: gravelly.	Slight	Moderate: gravelly.
SfC2, SfD2, SgC2, SgC3, SgD2, SgD3, SlD.	Moderate: slope	Slight	Moderate to severe: slope; gravelly.	Moderate: slope	Moderate: slope; gravelly.
ShA	Slight	Slight	Slight	Slight	Slight.
ShB2, SkB	Slight	Slight	Slight	Slight	Slight.

TABLE 5.—*Limitations of soils for recreational uses*—Continued

Soil series and map symbols	Degree and kind of limitation for—				
	Service buildings in recreational areas	Paths and trails	Athletic field and other intensive play areas	Picnic and extensive play areas	Campsites (tents and trailers)
Sassafras—Continued					
ShC2, ShC3, SkC	Slight	Slight	Moderate: slope	Slight	Moderate: slope.
SgE, SkE, SlE (For limitations of Aura and Collington soils in mapping units SlD and SlE, refer to interpretations in this table for Aura and Collington series, respectively.)	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Shrewsbury:					
SmA, SmB, SnA, So	Severe: high water table; poor drainage.	Severe: poor drainage.	Severe: poor drainage.	Severe: high water table; poor drainage.	Severe: poor drainage.
Silty and clayey land:					
SpB	Moderate: unstable.	Moderate: silty	Moderate: slope; slow permeability.	Slight	Moderate: silty; slow permeability.
SpC	Moderate: unstable; slope.	Moderate: silty	Severe: slope; slow permeability.	Moderate: slope	Moderate: silty; slow permeability.
SpE	Severe: unstable; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Sunnyside:					
StB2, SuB2, SwB	Slight	Slight	Slight	Slight	Slight.
StC2, SuC2, StD2, SuD2, SwC.	Slight to moderate: slope.	Slight	Moderate to severe: slope.	Slight to moderate: slope.	Slight to moderate: slope.
SvC3, SvD3	Moderate: slope	Moderate: sticky; slope.	Severe: slope	Slight	Moderate: sticky; slope.
StE	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Swamp:					
Sx	Severe: ponded	Severe: ponded	Severe: ponded	Severe: ponded	Severe: ponded.
Tidal marsh:					
Tm	Severe: marshy	Severe: marshy	Severe: marshy	Severe: marshy	Severe: marshy.
Westphalia:					
WaA	Slight	Slight	Slight	Slight	Slight.
WaB2, WaB3, WbB2, WeB2	Slight	Slight	Slight to moderate: slope.	Slight	Slight.
WaC2, WaC3, WaD2, WaD3, WbC2, WbD2, WeC2, WeC3, WeD3. (For limitations of Evesboro soils in mapping units WeB2, WeC2, WeC3, and WeD3, refer to interpretations in this table for the Evesboro series.)	Moderate: slope	Slight	Moderate to severe: slope.	Moderate to severe: slope.	Moderate to severe: slope.
Woodstown:					
WoA, WoB2, Wu	Moderate: seasonally high water table.	Slight	Moderate: seasonally wet.	Slight	Moderate: seasonally wet.
WoC2	Moderate: seasonally high water table.	Slight	Moderate: slope	Moderate: slope	Moderate: seasonally wet; slope.

All of the properties named in the foregoing paragraph may not limit a soil for all recreational uses, but most of the properties are limiting for most uses. Also, a single property may not equally limit a soil for all recreational uses. For example, a slope of more than 5 percent severely limits the use of a soil for a football field because much land leveling is required. On the other hand, only slopes of more than 15 percent severely limit the use of a soil for campsites and picnic areas, and even the steepest slopes do not limit the use of a soil for some kinds of parks.

A soil may be severely limited for some specified use and yet be put to that use. For example, soils severely limited in their use for paths and trails may be used for them if a better alternative route is not available, or if the severely limited route is more scenic or otherwise more desirable. The severely limited route, however, may require more preparation and maintenance.

Use of the Soil Survey in Community Planning.—In planning the use of soils for different kinds of community development, reliable information about the soils is needed so that the best use of each area can be determined. Generally, the soils most suitable for farming are the soils most suitable for building sites and other nonfarm uses, though some soils are more suitable for one kind of use than another. The nature of the soils, therefore, influences the selection of the kinds of soils that are suitable for an orderly plan for land use.

In Prince Georges County, among the soils that are well suited for farming without artificial drainage, especially if they are nearly level or gently sloping, are the Chillum, Collington, Elsinboro, Glenelg, Howell, Magnolia, Manor, Marr, Matapeake, Monmouth, Ochlockonee, Rumford, Sassafras, Sunnyside, and Westphalia. Many other soils are also suited to farming if they are adequately drained or are well protected. The use of soils for farming is discussed in the section "Descriptions of the Soils," in the subsection "Capability Groups of Soils," and in other parts of this soil survey.

The limitations for disposal of effluent from septic tanks are rated slight for soils having a slope range of less than 8 to 12 percent in the Collington, Elsinboro, Evesboro, Galestown, Glenelg, Manor, Marr, Matapeake, Ochlockonee, Rumford, Sassafras, Sunnyside, and Westphalia series (see table 4). The rating applies only to those soils in places where the housing density is low. Only those soils, therefore, are suitable for homes in places where a community sewage system is not planned, and the disposal of sewage is to be through septic tanks. If homesites are planned in areas of all other soils, a community system for disposing of sewage is needed, or special means of disposal must be used. The soils that have slight limitations for the use of septic tanks make up about 16 percent of the county, but the areas are fairly well distributed.

In large areas of the county, the soil, especially the subsoil, is so unstable that limitations are very severe for building foundations and other excavations, for earth moving, and for the construction of streets, parking lots, and shopping centers. In these areas building foundations settle and crack; roads settle, buckle, and warp; and entrenchments and embankments cave in or collapse without warning. These areas can be used for the purposes stated, but the limitations and hazards for such use should be recognized and appropriate safeguards taken. Safeguards are particularly needed on the Christiana soils, the Muirkirk soils, Sandy and clayey land, and Silty and clayey land because they have a clayey subsoil that is very unstable, especially when it is wet or has been disturbed by leveling or grading. These soils and land types make up about 6.3 percent of the county and occur chiefly in the northern and western parts of the county where community developments are large and are constantly expanding.

In any community, land is needed for recreational areas. The soils of the county that have only slight limitations to use for athletic fields and other nearly level intensive play areas are Collington fine sandy loam, Elsinboro loam, Elsinboro sandy loam, Marr fine sandy loam, Matapeake fine sandy loam, Ochlockonee sandy loam, local alluvium, Sassafras sandy loam, and Westphalia fine sandy loam, all having slopes of 0 to 2 percent. These soils occupy only about 2 percent of the county. On many other soils in the county the limitations to use for intensive play areas are moderate. These soils are too sandy, too gravelly, or somewhat too fine textured to provide a good surface, or they are seasonally wet or have gentle to moderate slopes (see table 5, p. 80).

Most of the well-drained soils having slopes of not more than about 15 percent have only slight limitations to use as parks and other recreational areas of low intensity. Soils on steep hillsides and on the narrow bottom lands that adjoin them are not well suited to use as farms or as building lots, but together may be useful for some kinds of recreation. These areas could well be used for parks.

Artificial ponds or small lakes are highly desirable for recreational use of the community and for their esthetic value. In the section "Engineering Uses of Soils," the suitability of the soils as sites for ponds is rated, and the types of ponds suitable for the soils are named (see table 9, p. 112).

Engineering Uses of Soils

In this subsection the physical properties of the soils of the county are related to problems of engineering. The properties of the soils were estimated on the basis of information obtained (1) by examining the soils closely in the field and evaluating their characteristics as they apply to engineering needs and (2) by testing samples taken from horizons of soils in selected series that are represented in Prince Georges County. Also considered were the results of tests made on samples of similar soils taken from Frederick, Somerset, and Queen Annes Counties, Md.; from Fairfax and Norfolk Counties, Va.; and from Chester and Delaware Counties, Pa. On the basis of the estimated physical properties, interpretations were made that will be helpful to those who use the soils of Prince Georges County for engineering purposes.

With the use of the soil map for identification, the engineering interpretations in this subsection can be useful for many purposes. It should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works that involve heavy loads or where the excavations are deeper than the depths

of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

This survey contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, commercial, residential, recreational, and other sites.
2. Make preliminary estimates of engineering properties of soils in planning drainage and irrigation systems, farm ponds and reservoirs, diversion terraces, and structures for soil and water conservation.
3. Make preliminary evaluations for ground and soil conditions that will aid in selecting locations for highways, airports, cables, sewerage and other pipelines, and in planning detailed investigations at the selected locations.
4. Locate probable sand and gravel deposits for use in structures.
5. Locate suitable borrow material for road fill and for the construction of dams, levees, dikes, and other embankments.
6. Locate clay deposits for use with other materials in dams and the like, and for the fabrication of brick or other ceramic products.

TABLE 6.—*Engineering*

[Tests performed by the Bureau of Public Roads (BPR) in accordance with standard

Soil name and location	BPR report number	Depth	Horizon	Mechanical analyses [1]				
				Percentage passing sieve—				
				¾ in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches						
Adelphia:								
330 feet northeast of State Route 202 and 0.75 mile southeast of Oak Grove Road. (Modal profile)	S-42201	0–10	Ap			100	99	27
	S-42202	16–25	B2			100	99	38
	S-42203	37–44	C1			100	99	36
200 feet west of State Route 197, about 500 feet south of the overpass of U.S. Highway No. 50, and 0.5 mile south of Belair. (Silty subsoil)	S-42204	0–11	Ap			100	98	42
	S-42205	32–40	B21	100	98	98	97	61
	S-42206	45–72	C	100	97	97	94	34
50 feet west of Church Road, 500 feet north of State Route 214, and about 2 miles east of Largo. (Subsoil finer than in modal)	S-42207	5–12	A2		100	99	98	74
	S-42208	17–29	B2		100	99	95	75
	S-42209	36–60	C			100	99	51
Beltsville:								
1 mile west of T.B. on Floral Park Road. (Modal profile)	S-42213	0–6	A21			100	99	76
	S-42214	18–30	B31x			100	99	82
	S-42215	45–60	C	100	99	98	97	74
2 miles west of Bowie on Springfield Hillmeade Road across from Perkins Chapel. (Substratum finer than in modal)	S-42210	2–9	A2			100	99	87
	S-42211	9–17	B21			100	99	89
	S-42212	21–48	B3x			100	96	79
0.5 mile south of Cheltenham on U.S. highway No. 301. (Substratum much finer than in modal)	S-42216	7–14	A2			100	98	89
	S-42217	39–52	B32x			100	97	74
	S-42218	52–122	C		100	99	95	68
Bibb:								
1.5 miles south of Croom. (Modal profile)	S-42222	10–15	A2g			100	99	77
	S-42223	15–29	B2g				100	88
	S-42224	45–72	C1	100	99	98	95	54
300 feet west of Bealle Hill Road and 200 feet north of Mattawoman Creek. (Subsoil coarser than in modal)	S-42219	4–10	A2g	100	97	96	92	74
	S-42220	10–26	IIA1g	100	96	92	84	56
	S-42221	36–51	IIIBg	98	84	79	70	31
200 feet northeast of Cross Road and 3 miles southeast of Cheltenham. (Sandy variant)	S-42225	2–18	A2	100	96	94	87	37
	S-42226	24–38	IIIA2			100	99	37
	S-42227	38–60	C	95	34	21	13	6
Christiana:								
1 mile south of Greenbelt. (Modal profile)	S-42228	3–7	A22	100	99	99	97	88
	S-42229	14–30	B2			100	98	92
	S-42230	30–72	C1			100	99	95

See footnotes at end of table.

7. Correlate performance of engineering structures with soil mapping units to develop information that will be useful in designing and maintaining engineering structures and installations.
8. Determine the suitability of soil mapping units for cross-country movement of vehicles and construction equipment.
9. Supplement the information obtained from other published maps and reports and aerial photographs to make maps and reports that can be readily used by engineers.
10. Develop preliminary estimates for design or construction purposes based on soil conditions pertaining to a particular area.

Much of the information in this subsection is in tables 6, 7, 8, and 9. Table 6 lists engineering data that were obtained when selected soils in the county were tested. Table 7 gives a brief description of the soils in the county and estimates of their physical properties. In table 8 are estimates of the suitability of the soils in the county as engineering materials, and in table 9 are engineering interpretations.

Some of the terms used by soil scientists may not be familiar to engineers. Other terms, though familiar, may have a special meaning in soil science. Most of the terms used in this subsection and other special terms are defined in the Glossary.

test data

procedure of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analyses [1]—Continued				Liquid limit	Plasticity index	Classification	
Percentage smaller than—							
0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified [2]
24	18	11	9	[3] NP	NP	A-2-4(0)	SM.
35	30	24	20	30	11	A-6(1)	SC.
33	27	24	22	34	10	A-4(0)	SM-SC.
34	21	12	9	NP	NP	A-4(1)	SM.
56	42	26	22	29	12	A-6(6)	CL.
29	24	21	19	31	10	A-2-4(0)	SM-CL.
67	50	30	21	31	10	A-4(8)	ML-CL.
68	57	40	33	43	19	A-7-6(12)	CL.
43	33	25	22	30	10	A-4(3)	CL.
69	44	19	12	22	3	A-4(8)	ML.
76	52	28	20	29	9	A-4(8)	CL.
68	54	38	30	34	16	A-6(10)	CL.
82	64	30	19	24	6	A-4(8)	ML-CL.
85	68	38	27	32	12	A-6(9)	CL.
76	62	37	27	32	14	A-6(10)	CL.
87	68	34	21	26	7	A-4(8)	ML-CL.
72	59	34	24	29	12	A-6(9)	CL.
65	57	46	40	52	29	A-7-6(16)	CH.
65	41	23	17	35	9	A-4(8)	ML-CL.
83	58	30	22	33	10	A-4(8)	ML-CL.
40	23	11	8	NP	NP	A-4(4)	ML.
70	55	33	21	35	10	A-4(8)	ML-CL.
51	41	27	18	26	8	A-4(4)	CL.
24	17	13	10	19	3	A-2-4(0)	SM.
30	20	11	8	NP	NP	A-4(0)	SM.
28	19	11	9	NP	NP	A-4(0)	SM.
5	4	2	1	NP	NP	A-1-a(0)	GP-GM.
85	71	38	24	30	9	A-4(8)	ML-CL.
91	85	64	49	59	31	A-7-6(20)	CH.
94	90	70	55	57	29	A-7-6(19)	MH-CH.

TABLE 6.—*Engineering*

Soil name and location	BPR report number	Depth	Horizon	Mechanical analyses [1]				
				Percentage passing sieve—				
				¾ in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
Christiana—Continued								
1 mile west-northwest of Glenn Dale. (Mottled variant)	S–42231	0–7	A2			100	99	84
	S–42232	10–18	B2			100	99	93
	S–42233	24–48	C			100	99	92
On Springfield Road near Beltsville Airport. (Sandy surface variant)	S–42234	1–5	A21	98	98	98	89	54
	S–42235	15–23	B2				100	99
	S–42236	43–72	C				100	99
Collington:								
400 feet west of the intersection of Church Road and State Route 450. (Modal profile)	S–42237	0–8	Ap			100	97	24
	S–42238	16–25	B2			100	98	36
	S–42239	47–60	C			100	96	23
At intersection of State Route 197 and Mitchellville Road. (Fine variant)	S–42240	2–12	A2			100	96	35
	S–42241	16–27	B2			100	97	51
	S–42242	37–72	C			100	97	39
0.4 mile south of State Route 450 on State Route 556. (Silty profile)	S–42243	2–13	A2			100	99	44
	S–42244	24–42	B22			100	99	69
	S–42245	52–72	C				100	35
Croom:								
1 mile north of Cheltenham on Tippett Road. (Modal profile)	S–42246	0–5	Ap	97	70	60	54	34
	S–42247	8–19	C1irx	99	82	70	62	36
	S–42248	19–72	C2irx	100	94	88	76	42
1 mile southeast of Suitland and 400 feet east of Suitland Road. (Silty profile)	S–42249	0–8	A2	94	83	80	74	58
	S–42250	8–19	B2	94	85	82	74	57
	S–42251	37–108	C2irx	85	58	46	30	18
1 mile north of Cheltenham on Tippett Road. (Nongravelly surface layer)	S–42252	0–6	Ap	100	98	96	78	51
	S–42253	6–27	C1irx	97	61	43	17	7
Marr:								
1 mile east of Upper Marlboro and 75 feet south of State Route 4. (Modal profile)	S–42254	0–9	Ap	100	98	97	96	55
	S–42255	12–26	B2				100	64
	S–42256	48–72	C3					39
150 feet north of Nottingham Road along Naylor Road. (Finer B3 and C horizons)	S–42257	0–6	Ap			100	99	56
	S–42258	12–22	B2				100	65
	S–42259	34–60	C					59
1 mile south of Upper Marlboro on Croom Station Road. (Very fine sandy profile)	S–42260	0–8	Ap	99	99	98	97	59
	S–42261	16–30	B22		99	98	97	58
	S–42262	55–70	C			100	99	58
Monmouth:								
Southwest of Church Road and U.S. Highway No. 50 at Rodenhauser Airport. (Modal profile)	S–42263	0–7	Ap	100	98	97	94	26
	S–42264	22–29	B22			100	98	50
	S–42265	45–72	C			100	93	24
0.6 mile west of St. Barnabas Church on Church Road. (Substratum finer than in modal)	S–42266	1–7	A2			100	98	22
	S–42267	19–33	B22			100	99	45
	S–42268	48–72	C			100	99	44
Southwest corner of University of Maryland Tobacco Experimental Farm on State Route 202. (Intergrades to Collington soils)	S–42269	0–9	Ap			100	98	19
	S–42270	21–30	B22			100	99	45
	S–42271	35–60	C			100	99	37
Sunnyside:								
500 feet east of Baltimore-Washington Parkway on Beaverdam Road. (Modal profile)	S–42272	2–8	A2	100	98	97	96	32
	S–42273	12–32	B2				100	45
	S–42274	32–48	C1			100	99	30

See footnotes at end of table.

test data [1]—Continued

Mechanical analyses [1]—Continued				Liquid limit	Plasticity index	Classification	
Percentage smaller than—						AASHO	Unified [2]
0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
80	59	27	15	23	5	A-4(8)	ML-CL.
90	78	54	40	40	17	A-6(11)	CL.
90	83	67	56	55	29	A-7-6(19)	CH.
52	45	28	20	22	5	A-4(4)	ML-CL.
97	88	62	45	50	23	A-7-6(15)	ML-CL.
97	85	59	44	48	22	A-7-6(14)	ML-CL.
21	17	10	8	NP	NP	A-2-4(0)	SM.
34	32	30	28	33	14	A-6(1)	SC.
22	21	19	17	NP	NP	A-2-4(0)	SM.
31	21	12	7	NP	NP	A-2-4(0)	SM.
48	43	36	33	38	18	A-6(6)	CL.
39	37	35	35	36	16	A-6(2)	SC.
37	25	14	11	NP	NP	A-4(2)	SM.
64	52	34	28	35	13	A-6(8)	ML-CL.
33	31	28	25	33	10	A-2-4(0)	SM-SC.
31	23	14	10	28	7	A-2-4(0)	SM-SC.
34	29	22	20	30	16	A-6(2)	SC.
40	34	27	24	36	20	A-6(4)	SC.
56	43	21	10	24	5	A-4(5)	ML-CL.
57	49	30	20	25	8	A-4(5)	CL.
17	15	11	9	28	12	A-2-6(0)	GC.
47	38	23	15	23	8	A-4(3)	CL.
7	6	5	3	18	4	A-1-a(0)	SP-SM.
47	33	20	16	23	4	A-4(4)	ML-CL.
54	49	42	39	45	20	A-7-6(11)	ML-CL.
24	17	14	12	NP	NP	A-4(1)	SM.
46	31	19	14	21	1	A-4(4)	ML.
57	44	29	23	29	11	A-6(6)	CL.
45	32	23	20	39	11	A-6(5)	ML.
44	31	24	23	29	9	A-4(5)	CL.
44	30	22	19	28	8	A-4(5)	CL.
44	29	20	17	26	6	A-4(5)	ML-CL.
22	16	11	9	NP	NP	A-2-4(0)	SM.
49	48	47	46	56	32	A-7-6(11)	SC.
23	21	20	20	32	6	A-2-4(0)	SM.
20	16	10	7	NP	NP	A-2-4(0)	SM.
44	43	42	41	46	23	A-7-6(6)	SC.
43	43	42	40	47	25	A-7-6(7)	SC.
16	13	8	6	NP	NP	A-2-4(0)	SM.
42	38	33	31	38	17	A-6(4)	SC.
35	33	29	27	33	11	A-6(1)	SM-SC.
29	23	16	11	NP	NP	A-2-4(0)	SM.
43	41	32	24	24	8	A-4(2)	SC.
29	26	21	16	NP	NP	A-2-4(0)	SM.

TABLE 6.—*Engineering*

Soil name and location	BPR report number	Depth	Horizon	Mechanical analyses [1]				
				Percentage passing sieve—				
				¾ in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
Sunnyside—Continued								
150 feet southeast of Jericho Park Road and 3 miles northwest of Bowie on State Route 197. (Subsoil finer than in modal)	S–42275	3–11	A2	100	99	99	90	35
	S–42276	26–35	B3	99	98	97	92	48
	S–42277	35–44	IIC1	98	96	95	92	75
0.25 mile west of Baltimore-Washington Parkway on Muirkirk Road. (Coarse sand profile)	S–42278	0–8	Ap	100	99	98	94	32
	S–42279	20–30	B2	100	98	96	88	36
	S–42280	30–50	C1	100	98	96	80	43
Westphalia:								
2 miles north of Upper Marlboro on U.S. Highway No. 301 and 500 yards south of truck-weighing station. (Modal profile)	S–42281	0–4	Ap	------	------	100	99	79
	S–42282	10–16	B	------	------	------	100	84
	S–42283	16–28	C1	------	------	------	100	54
0.5 mile east of Duley station. (Coarse variant)	S–42284	0–8	Ap	------	100	99	98	52
	S–42285	8–36	B	------	------	------	100	62
	S–42286	36–72	C	------	------	100	99	61
0.25 mile south of Pennsylvania Railroad crossing and 75 feet east of U.S. Highway No. 301. (Fine variant)	S–42287	0–8	Ap	------	------	100	99	50
	S–42288	14–39	B3	------	------	100	99	49
	S–42289	55–120	C2	------	------	------	100	35

[1] Mechanical analyses according to the AASHO Designation T 88–57 (*1*). Results by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical

TABLE 7.—*Descriptions of the soils and*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made land (Ma) are

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Adelphia (AdA, AdB2, AdC2, AhA, AhB2.).	Moderately well to somewhat poorly drained fine sandy loams and silt loams over about 2 feet of fine sandy loam or sandy clay loam; underlain by fine sandy loam that has a medium amount of glauconite; 1½ to 2 feet to seasonally high water table.	0–14	100	98–100	98–100	25–75
		14–37	98–100	98–100	95–100	40–75
		37–60	95–100	95–100	95–100	30–55
Aura (AuB2, AuC2, AuC3, AuD, AvE).	Well-drained gravelly loams over firm gravelly subsoil; underlain by a gravelly very hard substratum; 5 feet or more to water table. (For description and properties of the Croom soil in mapping unit AvE, see the Croom soil series.)	0–13	80–95	60–85	------	20–50
		13–30	80–95	65–85	------	45–65
		30–96	30–50	25–40	------	20–30
Beltsville (BeA, BeB2, BeC2, BlA, BlB2, BlC2, BlC3, BlD3, BmB, BmC).	Moderately well to well drained fine sandy loams and silt loams over a dense, impervious, compact layer (fragipan); underlain by sand, silt, clay, or gravel; 1 to 2 feet to a water table seasonally perched above the fragipan. Urban land in mapping units BmB and BmC consist of Beltsville soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–14	100	100	85–100	45–90
		14–50	100	100	95–100	75–90
		50–72	40–60	30–40	20–35	15–30

test data [1]—Continued

Mechanical analyses [1]—Continued				Liquid limit	Plasticity index	Classification	
Percentage smaller than—							
0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO	Unified [2]
33	28	17	11	17	2	A-2-4(0)	SM.
46	42	35	28	33	15	A-6(4)	SC.
74	69	51	39	48	24	A-7-6(15)	CL.
29	22	12	8	NP	NP	A-2-4(0)	SM.
33	25	17	12	19	4	A-4(0)	SM-SC.
40	32	20	12	20	5	A-4(2)	SM-SC.
72	52	31	24	34	11	A-6(8)	ML-CL.
76	58	34	27	38	16	A-6(10)	CL.
46	35	27	25	35	14	A-6(5)	CL.
39	27	20	17	26	3	A-4(3)	ML.
39	22	15	13	NP	NP	A-4(5)	ML.
40	24	18	16	33	4	A-4(5)	ML.
39	29	23	20	26	6	A-4(3)	SM-SC.
37	26	19	16	28	6	A-4(3)	SM-SC.
24	16	14	12	NP	NP	A-2-4(0)	SM.

analyses data used in this table are not suitable for naming textural classes for soil.

[2] Based on the Unified soil classification system (*10*). SCS and BPR have agreed to consider that all soils having plasticity indexes within 2 points from A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are SM-SC, ML-CL, and MH-CH.

[3] NP=Nonplastic.

estimates of their engineering properties

so variable that interpretations for them were not made]

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
SM or ML	A-2 or A-4	0. 20–6. 3	0. 18–0. 24	4. 0–5. 0			Low.
SM, SC, or CL	A-4 or A-6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	112–120	Low.
SM, SC, or CL	A-2 or A-4	0. 63–6. 3	0. 08–0. 12	4. 5–5. 0	12–18	112–120	Low.
SM	A-2 or A-4	0. 63–6. 3	0. 14–0. 20	4. 0–5. 0			Low.
SC or CL	A-6	0. 20–0. 63	0. 14–0. 20	4. 0–5. 0	12–18	111–120	Low.
GC	A-2 or A-6	0. 20–0. 63	0. 10–0. 14	4. 0–5. 0	8–12	120+	Low.
SM or ML	A-4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0			Low.
CL	A-6	<0. 20	0. 12–0. 18	4. 0–5. 0	10–15	115–125	Low.
SM	A-2	0. 20–2. 0	0. 08–0. 12	4. 0–5. 0	12–18	111–120	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Bibb:						
Sandy loam (Bn).	Poorly drained sandy loam on flood plains; consists of recent alluvium washed from Coastal Plain sediments; 0 to 1 foot to seasonally high water table; subject to flooding.	0–36	100	100	--------	20–40
		36–54	95–100	90–100	--------	40–90
Silt loam (Bo, Br).	Except that it is silty to a depth of 36 inches, this soil is like Bibb sandy loam. Urban land in mapping unit Br consists of Bibb soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–36	100	100	--------	65–85
		36–54	85–100	75–100	--------	60–90
Butlertown (BtB2).	Moderately well to well drained silt loam over about 3 feet of silty clay subsoil that has a weak fragipan in the lower part; underlain by friable silt loam; 2 to 3 feet to a seasonally high water table.	0–9	100	100	--------	90–100
		9–45	100	100	--------	85–100
		45–72	100	100	--------	70–100
Chillum (CaB2, CaC2, CaC3, CaD2, CbB, CbC, CbE).	Well-drained silt loams over 1 to 1½ feet of light silty clay loam; underlain by firm, dense, sandy gravel; 5 feet or more to water table. Urban land in mapping units CbB, CbC, and CbE consists of Bibb soils that have been disturbed in construction; properties are highly variable.	0–13	95–100	95–100	--------	60–80
		13–28	95–100	95–100	--------	70–90
		28–96	40–60	20–40	--------	5–20
Christiana:						
Clay (CcC3, CcD3, CcE3).	Well-drained soils that are clayey throughout; very unstable, especially when disturbed; 5 feet or more to water table.	0–7	100	100	--------	80–100
		7–120	100	100	--------	90–100
Fine sandy loam (CdA, CdB2, CdC2, CdD2). Silt loam (CeA, CeB2, CeC2, CeD2, CfB, CfE, CfC).	Except that they have a thin surface layer of fine sandy loam or silt loam, these soils are like Christiana clay. Urban land in mapping units CfB, CfC, and CfE consists of Christiana soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–7	95–100	95–100	--------	40–90
		7–120	100	100	--------	90–100
Codorus (Ch, Ck).	Moderately well drained silt loams on flood plains; consists of recent alluvium weathered from crystalline rock; bedrock at 6 to 20 feet or more; 1 to 2 feet to seasonally high water table; subject to flooding. Urban land in mapping unit Ck consists of Codorus soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–60	95–100	90–100	--------	75–90
Colemantown (Cl).	Poorly drained loam over clay or fine sandy clay to a depth of 60 inches or more; contains medium to large amount of glauconite; 0 to 1 foot to seasonally high water table.	0–11	100	100	--------	30–60
		11–60	100	100	--------	70–90
Collington:						
Fine sandy loam (CmA, CmB2, CmC2, CmC3, CmD2, CmD3, CmE2, CmE3, SlD, SlE). Silt loam (CoA, CoB2, CoC3).	Well-drained fine sandy loams, gravelly sandy loams, and silt loams over about 3½ feet of fine sandy loam or clay loam; underlain by sandy sediments that contain a medium amount of glauconite; 5 feet or more to water table. (For properties of the Sassafras and Aura soils in mapping units SlD and SlE, see the Sassafras and Aura soil series, respectively.)	0–13	100	100	90–100	25–45
		13–42	100	100	90–100	40–70
		42–52	100	100	85–100	20–40
		52–120	100	100	--------	5–15
Loamy fine sand (CnB2, CnC2, CnD2, CpB, CpC).	Except that they have a thicker, more sandy surface layer and a slightly less clayey subsoil, mapping units CnB2, CnC2, and CnD2 are like Collington fine sandy loams. The urban land in mapping units CpB and CpC consists of Collington soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–17	100	100	--------	5–15
		17–52	100	100	--------	30–45
		52–120	100	100	--------	5–15

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
SM	A–2 or A–4	0. 63–6. 3	0. 12–0. 18	4. 0–5. 0	10–15	111–120	Low.
SM, ML, or CL	A–6, A–7, A–4, or A–6	<0. 20	0. 15–0. 20	4. 0–5. 0	15–22	91–110	Moderate.
ML	A–4	0. 20–0. 63	0. 15–0. 20	4. 0–5. 0	12–18	101–110	Low.
CL	A–4 or A–6	<0. 20	0. 15–0. 20	4. 0–5. 0	15–22	91–110	Moderate.
ML	A–4	0. 63–2. 0	0. 18–0. 24	5. 1–5. 5			Low.
ML or CL	A–4 or A–6	0. 20–0. 63	0. 18–0. 24	4. 0–5. 5	12–18	101–110	Low.
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0	12–18	101–110	Low.
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 6–5. 5			Low.
CL	A–6	0. 63–2. 0	0. 18–0. 24	4. 6–5. 0	12–18	111–120	Low.
GM or SM	A–2	<0. 20–2. 0	0. 08–0. 12	4. 0–5. 0	8–12	111–120+	Low.
CL or CH	A–6 or A–7	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0			Moderate.
CH	A–7	<0. 20	0. 18–0. 24	4. 0–5. 0	18–24	91–100	Moderate.
SM or ML	A–2 or A–4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0			Low.
CH	A–7	<0. 20	0. 18–0. 24	4. 0–5. 0	18–24	91–100	Moderate.
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 6–5. 0	12–18	101–110	Low.
SM or ML	A–2 or A–4	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0			Low.
CL	A–6	<0. 20	0. 18–0. 24	4. 0–4. 5	12–18	100–110	Moderate.
SM	A–2 or A–4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0			Low.
SC or CL	A–4 or A–6	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0	12–17	111–120+	Low.
SM or SC	A–2 or A–6	0. 63–6. 3	0. 08–0. 12	4. 0–5. 0	10–15	111–120+	Low.
SM or SP	A–1 or A–3	2. 0–6. 3	0. 06–0. 10	4. 0–5. 0	8–12	101–110	Low.
SM or SP	A–1 or A–3	2. 0–6. 3	0. 06–0. 10	4. 0–5. 0			Low.
SC	A–2 or A–4	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0	12–17	120+	Low.
SM or SP	A–1 or A–3	2. 0–6. 3	0. 06–0. 10	4. 0–5. 0	8–12	101–110	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Comus (Cr).	Well-drained silt loam on flood plains; consists of recent alluvium weathered from crystalline rock; 6 to 20 feet or more to bedrock; 3 to 6 feet to seasonally high water table; subject to flooding.	0–32 32–60	100 70–90	100 60–80	--- ---	70–90 15–30
Croom (CsB2, CsC2, CsC3, CtB2, CtC2, CtC3, CtD2, CuB, CuC, CuE).	Somewhat excessively drained gravelly loams that have a very hard, compact subsoil and substratum; 5 feet or more to water table. Urban land in mapping units CuB, CuC, and CuE consists of Croom soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–12 12–28 28–48 48–120	50–70 60–80 60–70 50–90	40–60 40–70 40–60 40–90	--- --- --- ---	5–35 35–60 5–45 5–45
Donlonton (DoA, DoB2).	Moderately well drained fine sandy loams over sandy clay loam or sandy clay that extends to a depth of about 4 feet; underlain by fine sandy loam that has a moderate to large amount of glauconite; about 2 feet to a seasonally high water table.	0–12 12–50 50–60	100 100 100	100 100 100	--- --- ---	35–60 60–90 20–40
Elkton: Silt loam (Ek).	Poorly drained silt loam over clay or silty clay that extends to a depth of 8 feet or more; 0 to 1 foot to a seasonally high water table; may be ponded.	0–10 10–96	95–100 95–100	90–100 90–100	90–100 90–100	50–80 70–90
Fine sandy loam, thick surface (ElB).	Except that the surface layer is fine sandy loam and is thicker, this soil is like Elkton silt loam.	0–19 19–96	100 100	100 100	--- ---	20–35 70–90
Elsinboro (EmA, EmB2, EnA, EnB2, EnC2, EuB).	Well-drained loams and sandy loams over about 2 feet of heavy loam or light clay loam; underlain by gravelly sandy loam; 5 feet or more to water table. Urban land in mapping unit EuB consists of Elsinboro soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–9 9–35 35–72	100 85–95 75–90	85–95 80–95 60–80	--- --- ---	35–65 50–80 10–25
Evesboro (GeB, GeC, ReB, ReC, ReD, WeB2, WeC2, WeC3, WeD3).	Somewhat excessively drained; loose loamy sands grading to sand with depth; 5 feet or more to water table; contains fine gravel in places. (For description and properties of the Westphalia soils in mapping units WeB2 through WeD3, see the Westphalia soil series.)	0–48 48–72	80–100 35–100	70–100 25–90	60–95 60–95	5–15 0–10
Fallsington (Fl, Fs, Fu).	Poorly drained loams and sandy loams over 1½ feet of sandy clay loam; underlain by sandy material; 0 to 1 foot to seasonally high water table; may be ponded. Urban land in mapping unit Fu consists of Fallsington soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–12 12–34 34–48	95–100 95–100 95–100	95–100 95–100 95–100	95–100 75–100 65–100	30–55 20–55 10–25
Galestown (GaB, GaC, GdB, GdC, GmB, GmC, GeB, GeC).	Somewhat excessively drained, loose loamy sands, grading to sand with depth; gravelly in places; 5 feet or more to water table. Urban land in mapping units GmB and GmC consists of Galestown soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately. (For description and estimated properties of Evesboro soils in mapping units GeB and GeC, see the Evesboro soil series.)	0–43 43–120	80–100 35–100	70–100 25–90	--- ---	5–15 0–10
Glenelg (GnC2, GoB).	Well-drained loams over about 20 inches of loam or light silty clay loam; underlain by micaceous, loamy saprolite; 4 to 10 feet or more to bedrock; 5 feet or more to water table. Urban land in mapping unit GoB consists of Glenelg soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–11 11–30 30–120	90–100 90–100 85–95	80–95 80–95 80–90	--- --- ---	55–85 60–90 55–85

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	12–18	101–110	Low.
SM	A–2	0. 63–6. 3	0. 08–0. 12	4. 5–5. 0	10–15	110–120	Low.
GM or GP–GM	A–2	0. 63–6. 3	0. 10–0. 18	4. 5–5. 0			Low.
GC or CL	A–4	0. 20–0. 63	0. 15–0. 20	4. 5–5. 0	12–18	120+	Low.
GM or GP–GM	A–2 or A–4	0. 20–0. 63	0. 08–0. 15	4. 5–5. 5	10–15	120+	Low.
GP or GP–GM	A–1, A–2, or A–4	0. 63–2. 0	0. 06–0. 10	4. 5–5. 5	8–12	120+	Low.
ML or SM	A–4	0. 20–2. 0	0. 18–0. 24	4. 5–5. 5			Low.
CL	A–6	<0. 20	0. 18–0. 24	4. 5–5. 0	12–18	101–120	Moderate.
SC	A–2 or A–4	0. 20–2. 0	0. 18–0. 24	4. 5–5. 0	10–15	111–120	Low.
ML	A–4	0. 20–0. 63	0. 18–0. 27	4. 5–5. 0			Moderate.
CL or CH	A–6 or A–7	<0. 20	0. 18–0. 24	4. 0–5. 0	12–18	101–110	Moderate.
SM	A–2	0. 63–6. 3	0. 12–0. 20	4. 0–5. 0			Low.
CL or CH	A–6 or A–7	<0. 20	0. 18–0. 24	4. 0–5. 0	12–18	101–110	Moderate.
ML or SM	A–4	0. 63–2. 0	0. 12–0. 20	5. 1–5. 5			Low.
ML or MH	A–4 or A–5	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	12–18	101–110	Low.
SM or SP–SM	A–2	0. 63–2. 0	0. 12–0. 20	4. 5–5. 0	10–15	111–120	Low.
SM or SP	A–1 or A–3	6. 3+	<0. 06	4. 0–4. 5	10–14	105–120	Low.
SP or SP–SM	A–3 or A–1	6. 3+	<0. 06	4. 0–4. 5	10–14	101–110	Low.
ML or SM	A–4 or A–2	0. 20–6. 3	0. 18–0. 24	4. 0–5. 0			Low.
SM, SC, or ML	A–2 or A–6	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0	10–14	120+	Low.
SM or SP–SM	A–2 or A–3	0. 63–6. 3	<0. 08	4. 0–5. 0	12–14	101–110	Low.
SM or SP	A–1 or A–3	6. 3+	<0. 06	4. 0–5. 0	10–14	105–120	Low.
SP or SP–SM	A–3 or A–1	6. 3+	<0. 06	4. 0–5. 0	10–14	101–120	Low.
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0			Low.
ML or CL	A–6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	101–110	Low.
MH	A–5	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0	15–22	101–110	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Hatboro (Ha).	Poorly drained silt loam on flood plains; consists of recent alluvium weathered from crystalline rock; 6 to 20 feet or more to bedrock; 0 to 1 foot to seasonally high water table; subject to flooding.	0–36	95–100	90–100	-------	75–90
		36–48	90–100	80–100	-------	30–50
Howell:						
Clay loam (HcC3, HcD3).	Well-drained clay loams over about 2 feet of silty clay or silty clay loam; underlain by fine sandy silt; 5 feet or more to water table.	0–32	95–100	95–100	-------	75–90
		32–50	95–100	95–100	-------	60–80
Fine sandy loam (HoB2, HoC2). Silt loam (HwB2, HwC2, HwD2, HwE2).	Except that the surface layer is fine sandy loam or silt loam and is about 10 inches thicker, these soils are like Howell clay loam.	0–10	95–100	95–100	-------	50–60
		10–42	95–100	95–100	-------	75–90
		42–60	95–100	95–100	-------	60–80
Hyde (Hy).	Very poorly drained silt loam in depressions; highly organic surface layer over clay; underlain by sandy material; seasonally high water table is at or near the surface; ponded in places.	0–24	100	100	-------	70–90
		24–32	100	100	-------	85–100
		32–44	100	100	-------	85–100
		44–60	100	100	-------	0–10
Iuka (Ik, In, ImA, ImB, IoA, IoB, Iu, Ix).	Moderately well drained sandy loams, fine sandy loams, and silt loams on flood plains or foot slopes; consists of recent alluvium washed from the Coastal Plain; underlain by gravel in places; 1 to 2 feet to seasonally high water table; subject to flooding in most places. Urban land in mapping units Iu and Ix consists of Iuka soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–30	95–100	95–100	-------	45–85
		30–48	30–50	25–40	-------	15–30
Johnston (Jo, Ju).	Very poorly drained silt loams on flood plains; highly organic, silty surface layer over silt; underlain by sandy material of the Coastal Plain; seasonally high water table at or near the surface; ponded in places; subject to flooding. Urban land in mapping unit Ju consists of Johnston soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–24	100	100	-------	50–75
		24–38	100	100	-------	60–70
		38–48	70–90	60–80	-------	5–10
Keyport (KeA, KeB2, KeC2, KpA, KpB2, KpC2, KrC3, KuB).	Moderately well drained fine sandy loams, silt loams, and silty clay loams over thick layers of clay or silty clay; 1 to 2 feet to seasonally high water table. Urban land in mapping unit KuB consists of Keyport soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–9	100	100	90–100	65–90
		9–26	95–100	95–100	95–100	80–90
		26–54	95–100	95–100	95–100	80–90
Klej (Ky).	Moderately well drained, loose loamy sand to a depth of 6 feet or more; about 2 feet to a seasonally high water table.	0–54	100	100	-------	5–15
Leonardtown (LeA, LeB).	Poorly drained silt loams over a fragipan; underlain by Coastal Plain sediments; 0 to 1 foot to a seasonally perched water table.	0–12	95–100	95–100	95–100	90–100
		12–21	95–100	95–100	90–100	80–100
		21–49	95–100	95–100	90–100	70–100
		49–70	70–100	69–90	-------	40–70
Magnolia (MfB2, MgB2, MgC2).	Well-drained fine sandy loams and silt loams over 3½ feet of clay loam to silty clay; underlain by sandy loam; 5 feet or more to water table.	0–15	100	100	-------	40–70
		15–50	100	100	-------	70–90
		50–60	90–100	90–100	-------	15–35
Manor (MhB2, MhC2, MhD2, MhF2, MkC).	Well-drained to somewhat excessively drained soils that are loam throughout; thick saprolite substratum; 0 to 10 feet or more to bedrock; 5 feet or more to water table. Urban land in mapping unit MkC consists of Manor soils that have been disturbed in construction; properties are highly variable.	0–120	85–100	85–100	-------	50–70

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
ML or MH	A–4 or A–5	0. 20–0. 63	0. 18–0. 24	5. 1–5. 5	15–22	101–110	Low.
SM	A–2 or A–4	<0. 20–0. 63	0. 18–0. 24	5. 6–6. 0	15–22	101–110	Low.
CL	A–6	<0. 20	0. 18–0. 27	4. 0–5. 0	12–18	101–110	Moderate.
ML or MH	A–4 or A–5	0. 20–2. 0	0. 12–0. 18	4. 0–5. 0	15–22	101–110	Low.
ML	A–4	0. 20–2. 0	0. 12–0. 18	4. 5–5. 0			Low.
CL	A–6	0. 20–0. 63	0. 18–0. 27	4. 0–5. 0	12–18	101–110	Moderate.
ML or MH	A–4 or A–5	0. 20–2. 0	0. 12–0. 18	4. 0–5. 0	15–22	101–110	Low.
OH or OL	A–5 or A–7	0. 63–6. 3	0. 18–0. 27	4. 0–4. 5	20–28	65–90	High.
ML or OL	A–5	0. 20–2. 0	0. 18–0. 27	4. 5–5. 0	18–24	91–100	High.
CH or CL	A–7 or A–6	<0. 20	0. 18–0. 27	4. 5–5. 0	18–24	91–110	Moderate.
SP or SP–SM	A–3	2. 0–6. 3	<0. 06	4. 0–5. 0	10–14	101–110	Low.
SM or ML	A–4	0. 20–2. 0	0. 18–0. 24	4. 0–5. 0	12–18	101–110	Low.
GM	A–2	0. 63–2. 0	0. 12–0. 18	4. 0–4. 5	10–14	111–120+	Low.
ML or OL	A–4 or A–7	0. 63–2. 0	0. 18–0. 27	4. 5–5. 0	20–28	91–100	High.
ML	A–4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0	15–22	101–110	Low.
SP or SP–SM	A–3	2. 0–6. 3	<0. 06	4. 0–4. 5	10–14	101–110	Low.
ML	A–4	0. 20–2. 0	0. 18–0. 27	4. 5–5. 0			Low.
CL	A–6	<0. 20	0. 18–0. 24	4. 5–5. 0	10–17	101–110	Moderate.
CH	A–7	<0. 20	0. 18–0. 24	4. 5–5. 0	10–17	101–110	Moderate.
SM or SP	A–1 or A–3	0. 63–6. 3	<0. 06	4. 0–5. 0	10–14	101–110	Low.
ML	A–4	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0			Low.
CL	A–6	<0. 20	0. 12–0. 18	4. 0–5. 0	10–14	111–120	Moderate.
ML	A–4	<0. 20	0. 12–0. 18	4. 0–5. 0	10–14	111–120	Low.
ML or SM	A–4	0. 20–0. 63	0. 08–0. 12	4. 0–5. 0	8–12	120+	Low.
ML or SM	A–4	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0			Low.
CL	A–6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	10–17	101–110	Moderate.
SM	A–2	0. 63–2. 0	0. 12–0. 18	4. 5–5. 0	10–15	111–120	Low.
ML or MH	A–5	0. 63–2. 0	0. 18–0. 24	4. 5–5. 5	15–22	101–110	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Marr (MIA, MIB2, MIB3, MIC2, MIC3, MID3, MIE).	Well-drained fine sandy loams over about 2 feet of fine sandy clay loam; underlain by fine or very fine sandy loam; 5 feet or more to water table.	0–12	95–100	95–100	----	50–60
		12–34	95–100	95–100	----	55–70
		34–50	100	100	----	30–60
Matapeake:						
Fine sandy loam (MmA, MmB2).	Well-drained fine sandy loams and silt loams over 2 feet of light silty clay loam; underlain by sandy loam; gravelly in places; 5 feet or more to water table. Urban land in mapping units MpB and MpC consists of Matapeake soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–7	95–100	95–100	90–100	60–75
		7–34	95–100	95–100	90–100	60–85
Silt loam (MnA, MnB2, MnC2, MnC3, MnD2, MpB, MpC).		34–60	50–100	40–100	30–100	10–35
Silt loam, silty substratum (MoB2).	Except that it has a thicker subsoil and a silty substratum over deeper sandy materials, this soil is like Matapeake silt loam.	0–16	100	100	----	90–100
		16–60	100	100	----	95–100
		60–85	100	100	----	95–100
		85–120	90–95	80–95	----	0–5
Matawan:						
Fine sandy loam (MrA, MrB2, MrC2).	Moderately well to well drained, thick fine sandy loams over 20 inches of sandy clay loam; underlain by fine sandy clay; about 2 feet to a seasonally high water table.	0–20	100	100	----	20–40
		20–42	100	100	----	40–60
		42–50	100	100	----	60–80
Loamy sand (MsA, MsB).	Except for a thicker, coarser textured surface layer, this soil is like Matawan fine sandy loam.	0–20	100	100	----	5–15
		20–42	100	100	----	40–60
		42–50	100	100	----	60–80
Mattapex (MtA, MtB2, MuA, MuB2, MvB).	Moderately well drained fine sandy loams and silt loams over 2 feet of light silty clay loam that grades to fine sandy clay loam with depth; underlain by light fine sandy loam; about 2 feet to a seasonally high water table. Urban land in mapping unit MvB consists of Mattapex soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–13	100	95–100	90–100	55–75
		13–36	95–100	95–100	90–100	60–90
		36–48	90–100	85–100	60–100	10–35
Mixed alluvial land (Mw).	Poorly drained, variable soils on flood plains; seasonally high water table; properties not estimated.					
Monmouth:						
Clay loam (MxC3, MxD3).	Well-drained clay loams over thick sandy clay; 5 feet or more to water table.	0–50	100	100	95–100	40–50
Fine sandy loam (MyA, MyB2, MyC2, MyD2).	Except that the surface layer is fine sandy loam, this soil is like Monmouth clay loam.	0–11	95–100	95–100	90–100	15–30
		11–60	100	100	95–100	40–50
Muirkirk (MzB2, MzC2).	Well-drained to somewhat excessively drained, thick loamy sands over thick layers of unstable clay; 5 feet or more to water table.	0–28	100	100	----	5–15
		28–36	100	100	----	20–40
		36–60	100	100	----	80–100
Ochlockonee (OcA, OcB, OcC, OhA, OhB, Ok).	Well-drained sandy loams and silt loams in upland depressions; consists of recent alluvium that washed from the Coastal Plain and extends to a depth of 45 inches; below 45 inches the properties are highly variable; 3 feet or more to water table. Urban land in mapping unit Ok consists of Ochlockonee soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–45	95–100	95–100	----	35–75
		45–60	----	----	----	----
Othello (OI, Ot).	Poorly drained fine sandy loams and silt loams over 2½ feet of heavy silt loam or light silty clay loam; underlain by sandy material; 0 to 1 foot to a seasonally high water table; ponded in places.	0–12	95–100	95–100	90–100	70–95
		12–40	100	90–100	85–100	70–95
		40–60	85–100	80–100	55–95	15–40

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
ML	A-4	0. 63–6. 3	0. 18–0. 24	5. 1–5. 5			Low.
CL	A-4 or A-6	0. 63–2. 0	0. 18–0. 24	5. 1–5. 5	10–15	111–120+	Low.
SM or ML	A-2 or A-4	0. 63–6. 3	0. 12–0. 18	4. 5–5. 5	10–15	101–110	Low.
ML	A-4	0. 63–6. 3	0. 18–0. 27	4. 5–5. 0			Low.
CL	A-6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	101–110	Moderate.
SP–SM, SM or GM	A-2	0. 63–6. 3	0. 12–0. 18	4. 5–5. 0	10–15	101–120	Low.
ML	A-4	0. 63–2. 0	0. 18–0. 27	4. 5–5. 0			Low.
ML or CL	A-4 or A-6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	101–110	Moderate.
ML	A-4	0. 63–2. 0	0. 18–0. 27	4. 5–5. 0	12–18	101–110	Low.
SP	A-3	6. 3+	<0. 06	4. 0–5. 0	10–14	101–110	Low.
SM	A-2 or A-4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 5	12–18	101–110	Low.
CL or SC	A-6	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0	12–18	111–120+	Low.
CL or CH	A-6 or A-7	<0. 20	0. 18–0. 27	4. 0–5. 0	18–24	91–110	Moderate.
SM or SP–SM	A-1 or A-3	2. 0–6. 3	0. 06–0. 10	4. 0–5. 5	10–14	101–110	Low.
CL or SC	A-6	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0	12–18	111–120+	Low.
CL or CH	A-6 or A-7	<0. 20	0. 18–0. 27	4. 0–5. 0	18–24	91–110	Moderate.
ML	A-4	0. 20–2. 0	0. 18–0. 27	4. 5–5. 0			Low.
CL	A-6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	101–120	Moderate.
SM or SP–SM	A-2	0. 63–6. 3	0. 12–0. 18	4. 5–5. 0	10–15	101–120	Low.
SC or SM	A-6 or A-7	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	120+	Low.
SM	A-2	0. 63–2. 0	0. 12–0. 18	5. 1–5. 5	12–18		Low.
SC or SM	A-6	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	120+	Low.
SP–SM or SM	A-1 or A-3	2. 0–6. 3	<0. 06	4. 5–5. 5	10–14	101–110	Low.
SM	A-2 or A-4	0. 63–2. 0	0. 12–0. 18	4. 5–5. 5	12–18	111–120	Low.
CH	A-7	<0. 20	0. 18–0. 24	4. 5–5. 0	18–24	91–110	Moderate.
SM or ML	A-4	0. 63–2. 0	0. 18–0. 24	5. 1–6. 0 4. 0–5. 0	12–18	101–120	Low.
ML	A-4	0. 20–2. 0	0. 18–0. 27	4. 5–5. 0			Low.
CL or ML	A-6 or A-4	0. 20–0. 63	0. 18–0. 24	4. 5–5. 0	12–18	111–120	Moderate.
SM or SC	A-2 or A-4	0. 63–6. 3	0. 06–0. 12	4. 0–5. 0	10–14	111–120+	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Plummer (Pr).	Poorly drained and very poorly drained, loose loamy sand; grades to sand with depth; seasonally high water table at or near the surface; ponded in places. Rutlege soil in this mapping unit similar to the Plummer soil and has same properties.	0–30	100	100	--------	5–15
		30–60	100	100	--------	0–10
Rumford (RdA, RdB2, RdC2, RdC3, RdD2, ReB, ReC, ReD).	Well-drained, thick loamy sands over thin heavy sandy loam; underlain by loamy sand; 5 feet or more to water table. (For description and properties of the Evesboro soils in mapping units ReB, ReC, and ReD, see Evesboro soil series.)	0–17	85–100	80–100	50–85	10–20
		17–31	85–100	80–100	65–90	25–40
		31–54	80–100	75–100	30–85	5–20
Rutlege (Pr).	For description and properties of Rutlege soil and Plummer soils in this mapping unit, see the Plummer soil series.					
Sandy land, steep (SaE).	Mainly deep loose sand on steep slopes, contains thin layers of finer material in places and at variable depths; 5 feet or more to water table.	0–60	80–100	70–100	--------	0–15
Sandy and clayey land (ScB, ScC, ScD).	Well-drained to somewhat excessively drained, gently sloping to steep sandy materials of variable thickness over highly unstable clay.	Variable [2]	80–100	70–100	--------	5–20
		Variable	90–100	90–100	--------	85–100
Sassafras:						
Gravelly loam (SfB2, SfC2, SfD2).	Well-drained gravelly loams over 2½ feet of sandy clay loam; underlain by loamy sand that contains gravel in places; 5 feet or more to water table.	0–10	60–85	60–85	50–75	30–60
		10–40	70–85	70–85	60–80	45–75
		40–48	85–100	75–100	45–80	10–30
Gravelly sandy loam (SgB2, SgC2, SgC3, SgD2, SgD3, SgE, SlD, SlE). Sandy loam (ShA, ShB2, ShC2, ShC3, SkB, SkC, SkE).	Except that the surface layer contains less silt and clay and no gravel in some places, these soils are like Sassafras gravelly loams. Urban land in mapping units SkB, SkC, and SkE consists of Sassafras soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately. (For description and properties of the Collington and Aura soils in mapping units SlD and SlE, see Collington fine sandy loam and the Aura soil series, respectively.)	0–10	70–100	65–100	45–75	30–60
		10–40	80–100	75–100	65–90	25–55
		40–48	75–100	75–100	30–85	10–25
Shrewsbury (SmA, SmB, SnA, So).	Poorly drained sandy loams and silt loams over 2 feet of sandy clay loam; underlain by indurated material and sandy loam that has a large amount of glauconite; seasonally high water table at or near the surface; ponded in places. Urban land in mapping unit So consists of Shrewsbury soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–14	100	100	--------	35–60
		14–36	100	100	--------	30–60
		36–42	(Indurated material: ironstone or			
		42–60	100	100	--------	15–25
ilty and clayey land (SpB, SpC, SpE).	Well-drained silty materials of variable thickness over highly unstable clay.	Variable [2]	90–100	90–100	--------	60–90
		Variable	90–100	90–100	--------	85–100
Sunnyside:						
Fine sandy loam (StB2, StC2, StD2, StE). Loam (SuB2, SuC2, SuD2, SwB, SwC).	Well-drained fine sandy loams and loams over 3 feet of sandy clay loam or fine sandy loam; underlain by loamy fine sand; 5 feet or more to water table. Urban land in mapping units SwB, SwC consists of Sunnyside soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–12	95–100	95–100	90–100	30–50
		12–48	95–100	95–100	85–100	35–60
		48–60	95–100	95–100	80–100	10–20
Sandy clay loam (SvC3, SvD3).	Except that most of the original surface layer has been removed by erosion, these soils are like Sunnyside fine sandy loam and Sunnyside loam.	0–36	95–100	95–100	85–100	35–60
		36–50	95–100	95–100	80–100	10–20
Swamp (Sx).	Very wet soil materials; ponded in most places; physical properties not estimated.					

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
SM or SP-SM	A-1 or A-3	2. 0–6. 3	<0. 06	4. 0–5. 0	10–14	101–110	Low.
SP or SP-SM	A-3	6. 3+	<0. 06	4. 0–5. 0	10–14	101–110	Low.
SM or SP-SM	A-2 or A-3	2. 0–6. 3	<0. 06	4. 0–5. 0			Low.
SM or SC	A-2 or A-4	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	7–18	111–120+	Low.
SM or SP-SM	A-2 or A-3	2. 0–6. 3	<0. 06	4. 0–4. 5	9–15	101–120	Low.
SM or SP	A-1 or A-3	2. 0-6. 3+	<0. 06	4. 0–5. 0	10–14	101–120	Low.
SM or SP-SM	A-1 or A-3	2. 0–6. 3	<0. 06	4. 0–5. 0	9–15	101–110	Low.
CH	A-7	<0. 20	0. 18–0. 24	4. 0–5. 0	18–24	91–100	Moderate.
SM or ML	A-2 or A-4	2. 0–6. 3	0. 12–0. 18	4. 5–5. 0			Low.
SC or CL	A-6	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	7–18	111–120+	Low.
SP-SM or SM	A-2 or A-3	2. 0–6. 3	<0. 06	4. 0–4. 5	9–15	111–120	Low.
SM or ML	A-2 or A-4	2. 0–6. 3	0. 12–0. 18	4. 0–4. 5			Low.
SC or CL	A-2 or A-6	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	7–18	111–120+	Low.
SP-SM or SM	A-2 or A-3	2. 0–6. 3	<0. 06	4. 0–4. 5	9–15	111–120	Low.
SM or ML	A-4	0. 63–2. 0	0. 18–0. 24	4. 0–5. 0			Low.
SC or CL	A-2 or A-6	0. 20–2. 0	0. 18–0. 24	4. 0–4. 5	10–14	111–120+	Moderate.
ferruginous sandstone) SM	A-2	0. 63–2. 0	0. 06–0. 10	4. 5–5. 0	12–14	111–120	Low.
ML or CL	A-4 or A-6	0. 20–0. 63	0. 18–0. 24	4. 0–5. 0	18–24	101–110	Low.
CH	A-7	<0. 20	0. 18–0. 24	4. 0–5. 0	18–24	91–100	Moderate.
SM	A-2 or A-4	0. 63–2. 0	0. 12–0. 18	4. 5–5. 5			Low.
SC or CL	A-6	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	9–15	111–120+	Low.
SP-SM, SM, or CL	A-2 or A-3	2. 0–6. 3	0. 06	4. 0–4. 5	10–14	101–110	Low.
SC or CL	A-6	0. 20–2. 0	0. 18–0. 24	4. 5–5. 0	9–15	111–120+	Low.
SP-SM or SM	A-2 or A-3	2. 0–6. 3	0. 06	4. 0–5. 0	10–14	101–110	Low.

TABLE 7.—*Descriptions of the soils and estimates*

Soil series, soil types, land types, and map symbols	Description of soil and site	Depth from surface	Percentage passing sieve—			
			No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
		Inches				
Tidal marsh (Tm).	Saline soil materials; subject to tidal flooding; physical properties not estimated.					
Westphalia (WaA, WaB2, WaB3, WaC2, WaC3, WaD2, WaD3, WbB2, WbC2, WbD2, WeB2, WeC2, WeC3, WeD3).	Well-drained fine sandy loams and very fine sandy loams over about 1½ feet of fine sandy loam or light sandy clay loam; underlain by thick beds of fine or very fine sand that contains a trace of glauconite. (For description and estimated properties of the Evesboro soils in mapping units WeB2 through WeD3, see the Evesboro soil series.)	0–10 10–18 18–120	100 95–100 100	100 95–100 100	98–100 95–100 95–100	25–75 25–75 20–55
Woodstown (WoA, WoB2, WoC2, Wu).	Moderately well drained sandy loams over 2 feet of sandy clay loam; underlain by sandy loam; 1½ to 2 feet to a seasonally high water table. Urban land in mapping unit Wu consists of Woodstown soils that have been disturbed in construction; properties are highly variable and cannot be estimated accurately.	0–12 12–36 36–54	95–100 95–100 95–100	95–100 95–100 95–100	75–95 75–100 40–70	30–40 35–65 10–35

[1] Reaction is for unlimed soils; where soils have been limed, the pH is higher.

[2] The first layer ranges from 6 inches to 36 inches in thickness; the second layer extends to a depth of several feet.

TABLE 8.—*Suitability of soils*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made land

Soil series and map symbols	Suitability for earthwork—	
	When wet	When frozen
Adelphia (Ada, AdB2, AdC2, AhA, AhB2)	Poor	Poor
Aura (AuB2, AuC2, AuC3, AuD, AvE, SID, SIE) (For intepretations of the Croom soil in mapping unit AvE, refer to the Croom soil series; for interpretations of the Collington soils and the Sassafras soils in mapping units SID and SIE, refer to the Collington and Sassafras soil series, respectively.)	Fair	Fair
Beltsville (BeA, BeB2, BeC2, BIA, BIB2, BIC2, BIC3, BID3, BmB, BmC) (Properties of Urban land in mapping units BmB and BmC are variable and are not interpreted.)	Poor	Unsuitable
Bibb (Bn, Bo, Br) (Properties of Urban land in mapping unit Br are variable and are not interpreted.)	Poor	Unsuitable
Butlertown (BtB2)	Poor	Poor
Chillum (CaB2, CaC2, CaC3, CaD2, CbB, CbC, CbE) (Properties of Urban land in mapping units CbB, CbC, and CbE are variable and are not interpreted.)	Fair	Fair
Christiana (CcC3, CcD3, CcE3, CdA, CdB2, CdC2, CdD2, CeA, CeB2, CeC2, CeD2, CfB, CfC, CfE). (Properties of Urban land in mapping units CfB, CfC, and CfE are variable and are not interpreted.)	Unsuitable	Unsuitable

See footnotes at end of table.

of their engineering properties—Continued

Engineering classification		Permeability	Available water capacity	Reaction [1]	Moisture-density		Shrink-swell potential
Unified	AASHO				Optimum moisture	Maximum dry density	
		Inches per hour	*Inches per inch of depth*	*pH*	*Percent*	*Lbs. per cu. ft.*	
SM-SC or ML	A-2 or A-6	2. 0–6. 3	0. 18–0. 24	4. 0–5. 0			Low.
SM-SC, ML or CL	A-2 or A-6	0. 63–2. 0	0. 18–0. 24	4. 5–5. 0	10–15	111–120	Low.
SM, ML, or CL	A-1, A-2, A-3, or A-4	2. 0–6. 3	0. 08–0. 12	4. 5–5. 0	8–12	91–100	Low.
SM	A-2 or A-4	0. 63–6. 3	0. 12–0. 18	4. 0–5. 0			Low.
SM-SC, SM, ML, or ML-CL.	A-4 or A-6	0. 63–2. 0	0. 14–0. 21	4. 5–5. 0	7–18	111–120+	Low.
SM or SC	A-2	2. 0–6. 3	0. 06	4. 0–4. 5	9–15	111–120	Low.

as engineering material

(Ma) are so variable that interpretations for them were not made]

Susceptibility to frost action	Depth from [1] surface	Suitability as source of—			
		Topsoil	Sand	Gravel [2]	Road fill
	Inches				
Moderate	0–14	Good	Unsuitable	Unsuitable	Unsuitable.
	14–37	Not rated	Unsuitable	Unsuitable	Good.
	37–60	Not rated	Fair	Unsuitable	Good.
Low	0–13	Fair	Unsuitable	Unsuitable	Unsuitable.
	13–30	Not rated	Unsuitable	Fair	Good.
	30–96	Not rated	Unsuitable	Good	Good.
High	0–14	Fair	Unsuitable	Unsuitable	Unsuitable.
	14–50	Not rated	Unsuitable	Unsuitable	Poor.
	50–72	Not rated	Unsuitable	Locally fair	Poor to fair.
High	0–36	Fair	Unsuitable	Unsuitable	Poor.
	36–54	Not rated	Unsuitable	Unsuitable	Poor to fair.
Moderate	0–9	Good	Unsuitable	Unsuitable	Unsuitable.
	9–45	Not rated	Unsuitable	Unsuitable	Poor to fair.
	45–72	Not rated	Unsuitable	Unsuitable	Poor to fiar.
Low	0–13	Good	Unsuitable	Unsuitable	Unsuitable.
	13–28	Not rated	Unsuitable	Unsuitable	Fair to good.
	28–96	Not rated	Locally fair	Locally good	Good.
Moderate to high	0–7	Generally fair but unsuitable in severely eroded areas.	Unsuitable	Unsuitable	Unsuitable.
	7–120	Not rated	Unsuitable	Unsuitable	Very poor.

TABLE 8.—*Suitability of soil*

Soil series and map symbols	Suitability for earthwork—	
	When wet	When frozen
Codorus (Ch, Ck) (Properties of Urban land in mapping unit Ck are variable and are not interpreted.)	Poor	Unsuitable
Colemantown (Cl)	Poor	Poor
Collington (CmA, CmB2, CmC2, CmC3, CmD2, CmD3, CmE2, CmE3, CnB2, CnC2, CnD2, CoA, CoB2, CoC3, CpB, CpC, SID, SIE). (For interpretations of the Aura soils in mapping unit AvE, and the Sassafras soils in mapping units SID and SIE, refer to the Aura and Sassafras soil series, respectively. Properties of Urban land in mapping units CpB and CpC are variable and are not interpreted.)	Good	Good
Comus (Cr)	Poor	Unsuitable
Croom (AvE, CsB2, CsC2, CsC3, CtB2, CtC2, CtC3, CtD2, CuB, CuC, CuE) (For interpretations of the Aura soils in mapping unit AvE, refer to the Aura soil series. Properties of Urban land in mapping units CuB, CuC, and CuE are variable and are not interpreted.)	Good	Good
Donlonton (DoA, DoB2)	Poor	Poor
Elkton (Ek, EIB)	Poor	Poor
Elsinboro (EmA, EmB2, EnA, EnB2, EnC2, EuB) (Properties of Urban land in mapping unit EuB are variable and are not interpreted.)	Fair	Fair
Evesboro (GeB, GeC, ReB, ReC, ReD, WeB2, WeC2, WeC3, WeD3) (For interpretations of the Galestown soil in mapping units GeB and GeC, of the Rumford soil in units ReB, ReC, and ReD, and of the Westphalia soil in units WeB2, WeC2, WeC3, and WeD3, refer to the Galestown, the Rumford, and the Westphalia soil series, respectively.)	Good	Good
Fallsington (Fl, Fs, Fu) (Properties of Urban land in mapping unit Fu are variable and are not interpreted.)	Poor	Unsuitable
Galestown (GaB, GaC, GdB, GdC, GeB, GeC, GmB, GmC) (For interpretations of the Evesboro soils in mapping units GeB and GeC, refer to the Evesboro soil series. Properties of Urban land in mapping units GmB and GmC are variable and are not interpreted.)	Good	Good
Glenelg (GnC2, GoB) (Properties of Urban land in mapping unit GoB are variable and are not interpreted.)	Fair	Fair
Hatboro (Ha)	Poor	Unsuitable
Howell (HcC3, HcD3, HoB2, HoC2, HwB2, HwC2, HwD2, HwE2)	Poor	Unsuitable
Hyde (Hy)	Unsuitable	Unsuitable
Iuka (Ik, ImA, ImB, In, IoA, IoB. Iu, Ix) (Properties of Urban land in mapping units Iu and Ix are variable and are not interpreted.)	Poor	Poor

See footnotes at end of table.

as engineering material—Continued

Susceptibility to frost action	Depth from [1] surface	Suitability as source of—			
		Topsoil	Sand	Gravel [2]	Road fill
	Inches				
High	0–60	Fair to good	Unsuitable	Locally fair	Poor.
High	0–11	Fair	Unsuitable	Unsuitable	Unsuitable.
	11–60	Not rated	Unsuitable	Unsuitable	Very poor.
Generally moderate but low in loamy fine sand areas.	0–13	Generally good but fair in loamy fine sand areas.	Unsuitable	Unsuitable	Unsuitable.
	13–42	Not rated	Unsuitable	Unsuitable	Good.
	42–52	Not rated	Unsuitable	Unsuitable	Good.
	52–120	Not rated	Fair	Unsuitable	Fair.
Moderate	0–32	Good	Unsuitable	Unsuitable	Poor.
	32–60	Not rated	Locally fair	Locally fair	Fair to good.
Low	0–12	Poor to fair	Unsuitable	Unsuitable	Unsuitable.
	12–28	Not rated	Unsuitable	Good	Good.
	28–48	Not rated	Unsuitable	Good	Good.
	48–120	Not rated	Unsuitable	Good	Good.
High	0–12	Fair	Unsuitable	Unsuitable	Unsuitable.
	12–50	Not rated	Unsuitable	Unsuitable	Fair.
	50–60	Not rated	Unsuitable	Unsuitable	Good.
High	0–10	Poor to fair	Unsuitable	Unsuitable	Unsuitable.
	10–96	Not rated	Unsuitable	Unsuitable	Poor.
Moderate	0–9	Good	Unsuitable	Unsuitable	Unsuitable.
	9–35	Not rated	Unsuitable	Unsuitable	Fair.
	35–72	Not rated	Locally fair	Locally fair	Good.
Low	0–48	Poor	Fair	Locally fair	Fair.
	48–72	Not rated	Fair	Locally fair	Poor.
High	0–12	Fair	Unsuitable	Unsuitable	Unsuitable.
	12–34	Not rated	Unsuitable	Unsuitable	Good.
	34–48	Not rated	Fair	Unsuitable	Fair.
Low	0–43	Poor	Fair	Locally fair	Fair.
	43–120	Not rated	Fair	Locally fair	Poor.
Moderate	0–11	Good	Unsuitable	Unsuitable	Unsuitable.
	11–30	Not rated	Unsuitable	Unsuitable	Fair to good.
	30–120	Not rated	Unsuitable	Unsuitable	Fair.
High	0–36	Fair	Unsuitable	Unsuitable	Poor.
	36–48	Not rated	Unsuitable	Locally fair	Poor.
Moderate	0–10	Generally good but poor in severely eroded areas.	Unsuitable	Unsuitable	Unsuitable
	10–42	Not rated	Unsuitable	Unsuitable	Poor.
	42–60	Not rated	Unsuitable	Unsuitable	Poor.
High	0–24	Good [3]	Unsuitable	Unsuitable	Unsuitable.
	24–32	Not rated	Unsuitable	Unsuitable	Unsuitable.
	32–44	Not rated	Unsuitable	Unsuitable	Very poor.
	44–60	Not rated	Locally fair	Unsuitable	Poor to fair.
High	0–30	Fair to good	Unsuitable	Unsuitable	Poor to fair.
	30–48	Not rated	Variable	Variable	Good but variable in areas of local alluvium.

TABLE 8.—*Suitability of soils*

Soil series and map symbols	Suitability for earthwork—	
	When wet	When frozen
Johnston (Jo, Ju) (Properties of Urban land in mapping unit Ju are variable and are not interpreted.)	Poor	Unsuitable
Keyport (KeA, KeB2, KeC2, KpA, KpB2, KpC2, KrC3, KuB) (Properties of Urban land in mapping unit KuB are variable and are not interpreted.)	Poor	Poor
Klej (Ky)	Good	Fair
Leonardtown (LeA, LeB)	Poor	Unsuitable
Magnolia (MfB2, MgB2, MgC2)	Fair	Fair
Manor (MhB2, MhC2, MhD2, MhF2, MkC) (Properties of Urban land in mapping unit MkC are variable and are not interpreted.)	Fair	Fair
Marr (MlA, MlB2, MlB3, MlC2, MlC3, MlD3, MlE)	Fair	Fair
Matapeake (MmA, MmB2, MnA, MnB2, MnC2, MnC3, MnD2, MoB2, MpB, MpC) (Properties of Urban land in mapping units MpB and MpC are variable and are not interpreted.)	Fair	Fair
Matawan (MrA, MrB2, MrC2, MsA, MsB)	Fair	Generally poor but fair in loamy sand areas.
Mattapex (MtA, MtB2, MuA, MuB2, MvB) (Properties of Urban land in mapping unit MvB are variable and are not interpreted.)	Poor	Poor
Mixed alluvial land (Mw)	Poor to good	Generally unsuitable
Monmouth: Clay loam (MxC3, MxD3) Fine sandy loam (MyA, MyB2, MyC2, MyD2)	Poor Fair	Unsuitable Unsuitable
Muirkirk (MzB2, MzC2)	Good above 28 inches, unsuitable below.	Good above 28 inches, unsuitable below.
Ochlockonee (OcA, OcB, OcC, OhA, OhB, Ok) (Properties of Urban land in mapping unit Ok are variable and are not interpreted.)	Fair	Fair
Othello (Ol, Ot)	Poor	Poor
Plummer (Pr) (For interpretations of the Rutlege soil in this mapping unit, refer to the Rutlege soil series.)	Good	Poor
Rumford (RdA, RdB2, RdC2, RdC3, RdD2, ReB, ReC, ReD) (For interpretations of the Evesboro soils in mapping units ReB, ReC, and ReD, refer to the Evesboro soil series.)	Good	Good

See footnotes at end of table.

as engineering material—Continued

Susceptibility to frost action	Depth from [1] surface	Suitability as source of—			
		Topsoil	Sand	Gravel [2]	Road fill
	Inches				
High	0–24	Good [3]	Unsuitable	Unsuitable	Unsuitable.
	24–38	Not rated	Unsuitable	Unsuitable	Poor to fair.
	38–48	Not rated	Locally fair	Unsuitable	Poor to fair.
High	0–9	Generally fair but poor in severely eroded areas.	Unsuitable	Unsuitable	Unsuitable.
	9–26	Not rated	Unsuitable	Unsuitable	Fair.
	26–54	Not rated	Unsuitable	Unsuitable	Poor.
Moderate	0–54	Poor	Fair	Unsuitable	Poor.
High	0–12	Poor	Unsuitable	Unsuitable	Unsuitable.
	12–21	Not rated	Unsuitable	Unsuitable	Poor.
	21–49	Not rated	Unsuitable	Unsuitable	Poor to fair.
	49–70	Not rated	Unsuitable	Unsuitable	Fair.
Moderate	0–15	Good	Unsuitable	Unsuitable	Unsuitable.
	15–50	Not rated	Unsuitable	Unsuitable	Fair.
	50–60	Not rated	Locally fair	Unsuitable	Good.
Moderate	0–120	Fair to good	Unsuitable	Unsuitable	Poor; elastic.
Moderate	0–12	Good	Unsuitable	Unsuitable	Unsuitable.
	12–34	Not rated	Unsuitable	Unsuitable	Good.
	34–50	Not rated	Locally fair	Unsuitable	Fair to good.
Moderate	0–7	Good	Unsuitable	Unsuitable	Unsuitable.
	7–34	Not rated	Unsuitable	Unsuitable	Fair.
	34–60+	Not rated	Fair or unsuitable [4]	Fair or unsuitable	Fair or good. [5]
Generally high but moderate in loamy sand areas.	0–20	Fair	Locally fair	Unsuitable	Fair to poor.
	20–42	Not rated	Unsuitable	Unsuitable	Good.
	42–50	Not rated	Unsuitable	Unsuitable	Poor to fair.
High	0–13	Good	Unsuitable	Unsuitable	Unsuitable.
	13–36	Not rated	Unsuitable	Unsuitable	Fair.
	36–48	Not rated	Locally fair	Unsuitable	Good.
Generally high	(6)	Variable	Variable	Variable	Variable.
Moderate	0–50	Poor	Unsuitable	Unsuitable	Good.
Moderate	0–11	Good	Unsuitable	Unsuitable	Unsuitable.
	11–60	Not rated	Unsuitable	Unsuitable	Good.
Low	0–28	Poor	Fair	Unsuitable	Poor.
	28–36	Not rated	Unsuitable	Unsuitable	Good.
	36–60	Not rated	Unsuitable	Unsuitable	Very poor.
Moderate	0–45	Fair to good	Unsuitable	Unsuitable	Fair to good.
	45–60	Not rated	Variable	Variable	Variable.
High	0–12	Fair	Unsuitable	Unsuitable	Unsuitable.
	12–40	Not rated	Unsuitable	Unsuitable	Poor to fair.
	40–60	Not rated	Fair	Unsuitable	Fair to good.
High	0–30	Poor	Fair	Unsuitable	Poor.
	30–60	Not rated	Fair	Unsuitable	Poor.
Low	0–17	Fair	Unsuitable	Unsuitable	Unsuitable.
	17–31	Not rated	Unsuitable	Unsuitable	Good.
	31–54	Not rated	Fair	Locally fair	Fair to good.

TABLE 8.—*Suitability of soils*

Soil series and map symbols	Suitability for earthwork—	
	When wet	When frozen
Rutlege (Pr) (For interpretations of the Plummer soil in this mapping unit, refer to the Plummer soil series.)	Fair	Poor
Sandy land, steep (SaE)	Mostly good	Mostly good
Sandy and clayey land (ScB, ScC, ScD)	Surface layer good; subsoil unsuitable.	Surface layer fair; subsoil unsuitable.
Sassafras (SfB2, SfC2, SfD2, SgB2, SgC2, SgC3, SgD2, SgD3, SgE, ShA, ShB2, ShC2, ShC3, SkB, SkC, SkE, SlD, SlE). (Properties of Urban land in mapping units SkB, SkC, and SkE are variable and are not interpreted. For interpretations of the Collington soils and the Aura soils in mapping units SlD and SlE, refer to the Collington and the Aura soil series, respectively.)	Fair	Good
Shrewsbury (SmA, SmB, SnA, So) (Properties of Urban land in mapping unit So are variable and are not interpreted.)	Poor	Unsuitable
Silty and clayey land (SpB, SpC, SpE)	Surface layer poor; subsoil unsuitable.	Unsuitable
Sunnyside: Fine sandy loam (StB2, StC2, StD2, StE) Loam (SuB2, SuC2, SuD2, SwB, SwC) (Properties of Urban land in mapping units SwB and SwC are variable and are not interpreted.)	Fair	Fair
Sandy clay loam (SvC3, SvD3)	Poor	Poor
Swamp (Sx)	Variable	Unsuitable
Tidal marsh (Tm)	Variable	Unsuitable
Westphalia (WaA, WaB2, WaB3, WaC2, WaC3, WaD2, WaD3, WbB2, WbC2, WbD2, WeB2, WeC2, WeC3, WeD3). (For interpretations of the Evesboro soils in mapping units WeB2, WeC2, WeC3, and WeD3, refer to the Evesboro soil series.)	Good	Good
Woodstown (WoA, WoB2, WoC2, Wu) (Properties of Urban land in mapping unit Wu are variable and are not interpreted.)	Poor	Poor

[1] Depths listed here are of a typical profile for a soil in the series; these depths may vary slightly from place to place.

[2] Suitability is for only alluvial or waterworn gravel; shattered rock not included.

TABLE 9.—*Engineering*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made land

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Adelphia (AdA, AdB2, AdC2, AhA, AhB2)	Seasonally high water table; moderate corrosion potential; good stability.	Seasonally high water table; good stability; moderate frost action; slope.	Moderate seepage

as engineering material—Continued

Susceptibility to frost action	Depth from [1] surface	Suitability as source of—			
		Topsoil	Sand	Gravel [2]	Road fill
High	0–30	Fair [3]	Fair	Unsuitable	Poor.
	30–60	Not rated	Fair	Unsuitable	Poor.
Mostly low	0–60	Mostly poor	Mostly fair	Locally fair	Poor to fair.
Surface layer low; subsoil high.	(6)	Poor	Surface layer fair; subsoil unsuitable.	Unsuitable	Surface layer poor; subsoil very poor.
Moderate	0–10	Generally good, but fair in gravelly areas.	Unsuitable	Unsuitable	Unsuitable.
	10–40	Not rated	Unsuitable	Fair in gravelly areas	Good.
	40–48	Not rated	Fair	Locally fair to good	Good.
High	0–14	Fair	Unsuitable	Unsuitable	Unsuitable.
	14–36	Not rated	Unsuitable	Unsuitable	Good.
	36–42	Not rated	Unsuitable	Unsuitable	Unsuitable.
	42–60	Not rated	Locally fair	Unsuitable	Fair to good.
Surface layer moderate; subsoil high.	(6)	Fair	Unsuitable	Unsuitable	Very poor.
Moderate	0–12	Good	Unsuitable	Unsuitable	Unsuitable.
	12–48	Not rated	Unsuitable	Unsuitable	Good.
	48–60	Not rated	Locally fair	Unsuitable	Fair.
Moderate	0–36	Very poor	Unsuitable	Unsuitable	Good.
	36–50	Not rated	Locally fair	Unsuitable	Fair.
High	(6)	Not rated	Variable	Variable	Unsuitable.
High	(6)	Not rated	Unsuitable	Unsuitable	Unsuitable.
Low	0–10	Fair	Unsuitable	Unsuitable	Unsuitable.
	10–18	Not rated	Unsuitable	Unsuitable	Good.
	18–120	Not rated	Fair	Unsuitable	Poor to fair.
Moderate	0–12	Good	Unsuitable	Unsuitable	Unsuitable.
	12–36	Not rated	Unsuitable	Unsuitable	Good.
	36–54	Not rated	Locally fair	Unsuitable	Good.

[3] High or very high content of organic matter in the surface layer.
[4] In some places the silty substratum in mapping unit MoB2 is a good source of sand below a depth of 85 inches.
[5] The silty substratum in mapping unit MoB2 is a good source of fill below a depth of 60 inches.
[6] Variable.

interpretations of soils

(Ma) are so variable that interpretations for them were not made]

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Good stability; moderately erodible; high maximum dry density.	Moderately slow permeability; moderately erodible.	Moderate moisture-holding capacity; medium infiltration; impeded drainage.	Moderately erodible; good stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded or excavated.

TABLE 9.—*Engineering*

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Aura (AuB2, AuC2, AuC3, AuD, AvE, SID, SIE) (For properties of the Croom soil in mapping unit AvE, refer to interpretations for the Croom soil series; for properties of the Collington soils and the Sassafras soils in mapping units SID and SIE, refer to interpretations for the Collington and Sassafras soil series, respectively.)	Slight corrosion potential; very good stability.	Very good stability; slope.	Moderate seepage
Beltsville (BeA, BeB2, BeC2, BIA, BIB2, BIC2, BIC3, BID3, BmB, BmC). (Urban land in mapping units BmB and BmC is variable and is not included in the interpretation of those units.)	Perched water table: moderate corrosion potential; fair stability.	Perched water table; fair stability; severe frost action; slope.	Seepage very low in fragipan, low to moderate in substratum.
Bibb (Bn, Bo, Br) (Urban land in mapping unit Br is variable and is not included in the interpretation of that unit.)	Seasonally high water table; high corrosion potential; poor stability.	Seasonally high water table; flood hazard; poor stability; severe frost action.	Low to high seepage; constant source of water.
Butlertown (BtB2)	Seasonally high water table; moderate corrosion potential; fair stability.	Seasonally high water table; fair stability; moderate frost action.	Moderate seepage
Chillum (CaB2, CaC2, CaC3, CaD2, CbB, CbC, CbE) (Urban land in mapping units CbB, CbC, and CbE is variable and is not included in the interpretation of those units.)	Moderate corrosion potential; good stability.	Good stability; slope	Seepage moderate in subsoil, high in substratum.
Christiana (CcC3, CcD3, CcE3, CdA, CdB2, CdC2, CdD2, CeA, CeB2, CeC2, CeD2, CfB, CfC, CfE). (Urban land in mapping units CfB, CfC, and CfE is variable and is not included in the interpretation of those units.)	Moderate corrosion potential; extremely poor stability.	Extremely poor stability; moderate to severe frost action; slope.	Low seepage
Codorus (Ch, Ck) (Urban land in mapping unit Ck is variable and is not included in the interpretation of that unit.)	Seasonally high water table; 6 to 20 feet or more to bedrock; moderate corrosion potential; very poor stability.	Seasonally high water table; very poor stability; flood hazard; severe frost action.	Moderate seepage; 6 to 20 feet or more to bedrock; constant source of water.
Colemantown (Cl)	Seasonally high water table; high corrosion potential; very poor stability.	Seasonally high water table; very poor stability; severe frost action.	Low seepage
Collington (CmA, CmB2, CmC2, CmC3, CmD2, CmD3, CmE2, CmE3, CoA, CoB2, CoC3, CpB, CpC, SID, SIE). (For properties of the Aura soils and the Sassafras soils in mapping units SID and SIE, refer to interpretations for the Aura and Sassafras soil series, respectively. Urban land in mapping units CpB and CpC is variable and is not included in the interpretation of those units.)	Moderate corrosion potential; good stability.	Good stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Collington (CnB2, CnC2, CnD2)	Moderate corrosion potential; fair stability.	Fair stability; slope	Seepage moderate in subsoil, high in substratum.
Comus (Cr)	Water table at 3 to 6 feet or more; bedrock at 6 to 20 feet or more; slight corrosion potential; poor stability.	Seasonally high water table; flood hazard; poor stability; moderate frost action.	Seepage moderate in subsoil, high in substratum; 6 to 20 feet or more to bedrock; constant source of water.

See footnotes at end of table.

interpretations of soils—Continued

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Very good stability; highly erodible; very high maximum dry density.	Not needed	Low moisture capacity; medium infiltration.	Highly erodible; very good stability.	Low moisture-holding capacity; low fertility.	Impounded.
Fair stability; highly erodible; high maximum dry density.	Very slow permeability; highly erodible.	Moderate moisture-holding capacity; very slow infiltration; impeded drainage.	Highly erodible; fair stability; seepage above fragipan.	Moderate moisture-holding capacity; moderate fertility; seepage above fragipan.	Impounded.
Poor stability; moderately erodible; low to high maximum dry density.	Moderate permeability; moderately erodible.	Variable moisture-holding capacity and infiltration; poor drainage.	Moderately erodible; poor stability.	Variable moisture-holding capacity; moderate fertility.	Impounded or excavated.
Fair stability; highly erodible; medium maximum dry density.	Moderately slow permeability; highly erodible.	High moisture-holding capacity; medium infiltration; impeded drainage.	Highly erodible; fair stability.	High moisture-holding capacity; moderate fertility.	Impounded.
Good stability; moderately erodible; high maximum dry density.	Not needed	Moderate moisture-holding capacity; medium infiltration.	Moderately erodible; good stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Extremely poor stability; highly erodible; low maximum dry density.	Not needed	High moisture-holding capacity; slow infiltration.	Highly erodible; extremely poor stability.	High moisture-holding capacity; low fertility.	Impounded.
Very poor stability; highly erodible; medium maximum dry density.	Moderate permeability; highly erodible.	High moisture-holding capacity; medium infiltration; impeded drainage.	Highly erodible; very poor stability.	High moisture-holding capacity; moderate fertility.	Impounded or excavated.
Very poor stability; highly erodible; medium maximum dry density.	Slow permeability; highly erodible.	High moisture-holding capacity; slow infiltration; poor drainage.	Highly erodible; very poor stability.	High moisture-holding capacity; moderate fertility.	Excavated or impounded.
Good stability; moderately erodible; high maximum dry density.	Not needed	Moderate moisture-holding capacity; medium infiltration.	Moderately erodible; good stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair stability; medium to high maximum dry density.	Not needed	Low moisture-holding capacity; rapid infiltration.	Fair stability	Low moisture-holding capacity; moderate fertility.	Impounded.[2]
Poor stability; highly erodible; medium maximum dry density.	Not needed	High moisture-holding capacity; moderately slow infiltration.	Highly erodible; poor stability.	High moisture-holding capacity; moderate fertility.	Impounded.[2]

TABLE 9.—*Engineering*

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Croom (CsB2, CsC2, CsC3, CtB2, CtC2, CtC3, CtD2, CuB, CuC, CuE, AvE). (For properties of the Aura soil in mapping unit AvE, refer to interpretations for the Aura soil series. Urban land in mapping units CuB, CuC, and CuE is variable and is not included in the interpretation of those units.)	Slight corrosion potential; very good stability.	Very good stability; slope.	Moderate seepage.
Donlonton (DoA, DoB2)	Seasonally high water table; moderate corrosion potential; poor stability.	Water table; poor stability; severe frost action.	Low seepage.
Elkton (Ek, EIB)	Seasonally high water table; high corrosion potential; poor stability.	Seasonally high water table; poor stability; severe frost action; plastic clay.	Very low seepage.
Elsinboro (EmA, EmB2, EnA, EnB2, EnC2, EuB) (Urban land in mapping unit EuB is variable and is not included in the interpretation of that unit.)	Moderate corrosion potential; fair to good stability.	Fair to good stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Evesboro (GeB, GeC, ReB, ReC, ReD, WeB2, WeC2, WeC3, WeD3). (Interpretations are for the Evesboro soils in the mapping units listed.)	Slight corrosion potential; loose; fair stability.	Fair stability; loose; slope.	Excessive seepage.
Fallsington (Fl, Fs, Fu) (Urban land in mapping unit Fu is variable and is not included in the interpretation of that unit.)	Seasonally high water table; high corrosion potential; fair to good stability.	Seasonally high water table; fair to good stability; severe frost action.	Seepage moderate in subsoil, high in substratum.
Galestown (GaB, GaC, GdB, GdC, GeB, GeC, GmB, GmC) (For properties of the Evesboro soils in mapping units GeB and GeC, refer to interpretations for the Evesboro soil series. Urban land in mapping units GmB and GmC is variable and is not included in the interpretation of those units.)	Slight corrosion potential; generally loose; fair stability.	Fair stability; generally loose; slope.	Excessive seepage.
Glenelg (GnC2, GoB) (Urban land in mapping unit GoB is variable and is not included in the interpretation of that unit.)	Bedrock 4 to 10 feet or more; moderate corrosion potential; fair to good stability.	Fair to good stability; moderate frost action; slope.	Moderate seepage; 4 to 10 feet or more to bedrock.
Hatboro (Ha)	Seasonally high water table; 6 to 20 feet or more to bedrock; high corrosion potential.	Seasonally high water table; flood hazard; very poor stability; severe frost action.	Moderate seepage; 6 to 20 feet or more to bedrock; constant source of water.
Howell (HcC3, HcD3, HoB2, HoC2, HwB2, HwC2, HwD2, HwE2).	Moderate corrosion potential; poor to fair stability.	Poor to fair stability; moderate frost action; slope.	Low seepage.
Hyde (Hy)	Seasonally high water table; high corrosion potential; very poor stability.	Seasonally high water table; ponding; very poor stability; severe frost action.	Very low seepage.
Iuka (Ik, In, ImA, ImB, IoA, IoB, Iu, Ix) (Urban land in mapping units Iu and Ix is variable and is not included in the interpretation of those units.)	Seasonally high water table; moderate corrosion potential; poor stability.	Seasonally high water table; poor stability; flood hazard in places; severe frost action.	Moderate seepage; constant source of water in places.

See footnotes at end of table.

interpretations of soils—Continued

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Very good stability; highly erodible; very high maximum dry density.	Not needed	Low moisture-holding capacity; medium infiltration.	Highly erodible; very good stability.	Low moisture-holding capacity; low fertility.	Impounded.
Poor stability; highly erodible; medium to high maximum dry density.	Slow permeability; highly erodible.	Moderate moisture-holding capacity; slow infiltration; impeded drainage.	Highly erodible; poor stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded or excavated.
Poor to fair stability; moderately erodible; medium maximum dry density.	Very slow permeability; highly erodible.	High moisture-holding capacity; very slow infiltration; poor drainage.	Highly erodible; poor stability.	High moisture-holding capacity; moderate fertility.	Excavated or impounded.
Fair to good stability; moderately erodible; medium to high maximum dry density.	Not needed	High moisture-holding capacity; medium infiltration.	Moderately erodible; fair to good stability.	High moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair stability; medium maximum dry density.	Not needed	Low moisture-holding capacity; very rapid infiltration.	Fair stability	Low moisture-holding capacity; low fertility.	Impounded.[2]
Fair to good stability; moderately erodible; medium to high maximum dry density.	Moderate permeability; moderately erodible.	Moderate moisture-holding capacity; medium infiltration; poor drainage.	Moderately erodible; fair to good stability.	Moderate moisture-holding capacity; moderate fertility.	Excavated or impounded.
Fair stability; medium maximum dry density.	Not needed	Low moisture-holding capacity; very rapid infiltration.	Fair stability	Low moisture-holding capacity; low fertility.	Impounded.[2]
Fair to good stability; moderately erodible; medium maximum dry density.	Not needed	High moisture-holding capacity; medium infiltration.	Moderately erodible; fair to good stability.	High moisture-holding capacity; moderate fertility.	Impounded.
Very poor stability, moderately erodible; medium maximum dry density.	Moderate permeability; moderately erodible.	High moisture-holding capacity; medium infiltration; poor drainage.	Moderately erodible; very poor stability.	High moisture-holding capacity; moderate fertility.	Impounded or excavated.
Poor to fair stability; highly erodible; medium maximum dry density.	Not needed	High moisture-holding capacity; moderately slow infiltration.	Highly erodible; poor to fair stability.	High moisture-holding capacity; moderate fertility.	Impounded.
Very poor stability; highly erodible; low maximum dry density.	Very slow permeability; highly erodible.	High moisture-holding capacity; slow infiltration; very poor drainage.	Highly erodible; very poor stability.	High moisture-holding capacity; low fertility.	Excavated or impounded.
Poor stability; highly erodible; medium to high maximum dry density.	Moderate to moderately slow permeability; highly erodible.	Moderate to high moisture-holding capacity; moderate to moderately slow infiltration; impeded drainage.	Highly erodible; poor stability.	Moderate to high moisture-holding capacity; low fertility.	Impounded or excavated.

TABLE 9.—*Engineering*

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Johnston (Jo, Ju) (Urban land in mapping unit Ju is variable and is not included in the interpretation of that unit.)	Seasonally high water table; high corrosion potential; Very poor stability.	Seasonally high water table; very poor stability; flood hazard; severe frost action.	Moderate seepage; constant source of water.
Keyport (KeA, KeB2, KeC2, KpA, KpB2, KpC2, KrC3, KuB) (Urban land in mapping unit KuB is variable and is not included in the interpretation of that unit.)	Seasonally high water table; high corrosion potential; poor to fair stability.	Seasonally high water table; poor to fair stability; severe frost action; slope.	Low seepage
Klej (Ky)	Seasonally high water table; moderate corrosion potential; fair stability.	Seasonally high water table; fair stability; moderate frost action.	High seepage
Leonardtown (LeA, LeB)	Seasonally high perched water table; high corrosion potential; poor stability.	High perched water table; poor stability; severe frost action.	Very low seepage
Magnolia (MfB2, MgB2, MgC2)	Moderate corrosion potential; good stability.	Good stability; moderate frost action; slope.	Moderate seepage
Manor (MhB2, MhC2, MhD2, MhF2, MkC) (Urban land in mapping unit MkC is variable and is not included in the interpretation of that unit.)	Bedrock 6 to 10 feet or more; slight corrosion potential; poor to fair stability.	Poor to fair stability; moderate frost action; slope.	High seepage; 6 to 10 feet or more to bedrock.
Marr (MlA, MlB2, MlB3, MlC2, MlC3, MlD3, MlE)	Slight corrosion potential; fair stability.	Fair stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Matapeake (MmA, MmB2, MnA, MnB2, MnC2, MnC3, MnD2, MoB2, MpB, MpC). (Urban land in mapping units MpB and MpC is variable and is not included in the interpretation of those units.)	Moderate corrosion potential; fair to good stability.	Fair to good stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Matawan (MrA, MrB2, MrC2, MsA, MsB)	Seasonally high water table; moderate corrosion potential; fair stability.	Fair stability; moderate to severe frost action; slope.	Low seepage
Mattapex (MtA, MtB2, MuA, MuB2, MvB) (Urban land in mapping unit MvB is variable and is not included in the interpretation of that unit.)	Seasonally high water table; moderate corrosion potential; fair stability.	Fair stability; severe frost action.	Seepage moderate in subsoil, high in substratum.
Mixed alluvial land (Mw)	Seasonally high water table; mostly high corrosion potential; variable stability.	Seasonally high water table; variable stability; mostly severe frost action; flood hazard.	Variable seepage; constant source of water.
Monmouth (MxC3, MxD3, MyA, MyB2, MyC2, MyD2)	Moderate corrosion potential; good stability.	Good stability; moderate frost action; slope.	Low seepage
Muirkirk (MzB2, MzC2)	Moderate corrosion potential; extremely poor subsoil stability.	Extremely poor subsoil stability; low frost action; slope.	Low seepage

See footnotes at end of table.

interpretations of soils—Continued

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Very poor stability; moderately erodible; medium maximum dry density.	Moderate permeability; moderately erodible.	High moisture-holding capacity; moderate infiltration; very poor drainage.	Moderately erodible; very poor stability.	High moisture-holding capacity; moderate fertility.	Impounded or excavated.
Poor to fair stability; highly erodible; medium maximum dry density.	Very slow permeability; highly erodible.	High moisture-holding capacity; slow infiltration; impeded drainage.	Highly erodible; poor to fair stability.	High moisture-holding capacity; moderate fertility.	Impounded or excavated.
Fair stability; medium maximum dry density.	Rapid permeability	Low moisture-holding capacity; rapid infiltration; impeded drainage.	Fair stability	Low moisture-holding capacity; low fertility.	Impounded.[2]
Poor stability; highly erodible; medium to high maximum dry density.	Very slow permeability; highly erodible.	Moderate moisture-holding capacity; slow infiltration; poor drainage.	Highly erodible; poor stability.	Moderate moisture-holding capacity; low fertility.	Impounded and excavated.
Good stability; moderately erodible; high maximum dry density.	Not needed	High moisture-holding capacity; medium infiltration.	Moderately erodible; good stability.	High moisture-holding capacity; moderate fertility.	Impounded.
Poor to fair stability; highly erodible; medium maximum dry density.	Not needed	Moderate moisture-holding capacity; medium to rapid infiltration.	Highly erodible; poor to fair stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair stability; moderately erodible; medium to high maximum dry density.	Not needed	Moderate moisture-holding capacity; medium infiltration.	Moderately erodible; fair stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair to good stability; moderately erodible; medium maximum dry density.	Not needed	High moisture-holding capacity; medium infiltration.	Moderately erodible; fair to good stability.	High moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair stability; moderately erodible; medium maximum dry density.	Moderately slow permeability; moderately erodible.	Low to moderate moisture-holding capacity; medium to rapid infiltration; impeded drainage.	Moderately erodible; fair stability.	Low to moderate moisture-holding capacity and fertility.	Impounded.
Fair stability; highly erodible; medium maximum dry density.	Moderately slow permeability; highly erodible.	High moisture-holding capacity; medium infiltration.	Highly erodible; fair stability.	High moisture-holding capacity; moderate fertility.	Impounded and excavated.
Variable stability, erodibility, and maximum dry density.	Variable permeability and erodibility.	Variable moisture-holding capacity and infiltration rate.	Variable erodibility and stability.	Variable moisture capacity and stability.	Impounded.
Good stability; highly erodible; high to very high maximum dry density.	Not needed	High moisture-holding capacity; medium infiltration.	Highly erodible; good stability.	High moisture-holding capacity and fertility.	Impounded.
Extremely poor subsoil stability; low to high maximum dry density.	Not needed	Low moisture-holding capacity; rapid infiltration.	Extremely poor subsoil stability.	Low moisture-holding capacity and fertility.	Impounded.

TABLE 9.—*Engineering*

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Ochlockonee (OcA, OcB, OcC, OhA, OhB, Ok) (Urban land in mapping unit Ok is variable and is not included in the interpretation of that unit.)	Water table at depth of 3 feet or more; slight corrosion potential; poor stability.	Water table at depth of 3 feet or more; poor stability; moderate frost action.	Variable seepage
Othello (Ol, Ot)	Seasonally high water table; high corrosion potential; poor stability.	Seasonally high water table; poor stability; severe frost action.	Low seepage
Plummer (Pr) (For properties of the Rutlege soil in the mapping unit Pr, refer to interpretations for Rutlege soil series.)	Seasonally high water table; high corrosion potential; poor stability.	Seasonally high water table; poor stability; severe frost action.	Excessive seepage
Rumford (RdA, RdB2, RdC2, RdC3, RdD2, ReB, ReC, ReD) (For properties of the Evesboro soils in mapping units ReB, ReC, and ReD, refer to interpretations for the Evesboro soil series.)	Slight corrosion potential; fair stability.	Fair stability; low frost action; slope.	Seepage moderate in subsoil, high in substratum.
Rutlege (Pr) (For properties of the Plummer soil in the mapping unit Pr, refer to interpretations for the Plummer soil series.)	Seasonally high water table; severe corrosion potential; very poor stability.	Seasonally high water table; very poor stability; severe frost action.	Excessive seepage
Sandy land, steep (SaE)	Mostly loose; slight corrosion potential; mostly fair stability.	Mostly fair stability; loose; slope.	Mostly excessive seepage.
Sandy and clayey lands (ScB, ScC, ScD)	Moderate corrosion potential; extremely poor subsoil stability.	Extremely poor stability; slight to severe frost action; slope.	Low seepage
Sassafras (SfB2, SfC2, SfD2, SgB2, SgC2, SgC3, SgD2, SgD3, SgE, ShA, ShB2, ShC2, ShC3, SkB, SkC, SkE, SlD, SlE). (For properties of the Aura and the Collington soils in mapping units SlD and SlE, refer to interpretations for the Aura and Collington soil series, respectively. Urban land in mapping units SkB, SkC, and SkE is variable and is not included in the interpretation of those units.)	Slight corrosion potential; good stability.	Good stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Shrewsbury (SmA, SmB, SnA, So) (Urban land in mapping unit So is variable and is not included in the interpretation of that unit.)	Seasonally high water table; high corrosion potential; fair to good stability.	High water table; fair to good stability; severe frost action.	Seepage moderate in subsoil, high in substratum.
Silty and clayey lands (SpB, SpC, SpE)	Moderate corrosion potential; extremely poor stability.	Extremely poor stability; moderate to severe frost action; slope.	Low seepage
Sunnyside (StB2, StC2, StD2, StE, SuB2, SuC2, SuD2, SvC3, SvD3, SwB, SwC). (Urban land in mapping units SwB and SwC is variable and is not included in the interpretation of those units.)	Moderate corrosion potential; fair stability.	Fair stability; moderate frost action; slope.	Seepage moderate in subsoil, high in substratum.
Swamp (Sx)	Mostly permanent high water table; ponded in most places; severe corrosion potential; poor or no stability.	Mostly permenent high water table; ponded in most places; poor or no stability; severe frost action.	Variable seepage

See footnotes at end of table.

interpretations of soils—Continued

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Poor stability; highly erodible; medium to high maximum dry density.	Not needed	Moderate to high moisture-holding capacity; medium infiltration.	Highly erodible; poor stability.	Moderate to high moisture-holding capacity; low fertility.	Impounded.
Poor stability; moderately erodible; medium maximum dry density.	Slow permeability; moderately erodible.	High moisture-holding capacity; medium infiltration; poor drainage.	Moderately erodible; poor stability.	High moisture-holding capacity; moderate fertility.	Impounded or excavated.
Poor stability; medium maximum dry density.	Rapid permeability	Very low moisture-holding capacity; rapid infiltration; poor drainage.	Poor stability	Very low moisture-holding capacity and fertility.	Excavated.
Fair stability; medium maximum dry density.	Not needed	Low moisture-holding capacity; rapid infiltration.	Fair stability	Low moisture-holding capacity and fertility.	Impounded.[2]
Very poor stability; medium maximum dry density.	Rapid permeability	Very low moisture-holding capacity; rapid infiltration; very poor drainage.	Very poor stability	Very low moisture-holding capacity; low fertility.	Excavated.
Mostly fair stability; medium maximum dry density.	Not needed	Mostly low moisture-holding capacity; very rapid infiltration.	Mostly fair stability	Mostly low moisture-holding capacity and fertility.	Impounded.[2]
Extremely poor subsoil stability; low to medium maximum dry density; very highly erodible.	Not needed	Variable moisture-holding capacity and infiltration.	Very highly erodible; extremely poor subsoil stability.	Variable moisture-holding capacity; very low fertility.	Impounded.
Good stability; moderately erodible; high maximum dry density.	Not needed	Moderate moisture-holding capacity; medium infiltration.	Moderately erodible; good stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Fair to good stability; moderately erodible; high maximum dry density.	Moderate permeability; moderately erodible.	Moderate moisture-holding capacity; medium infiltration; poor drainage.	Moderately erodible; fair to good stability.	Moderate moisture-holding capacity; moderate fertility.	Excavated or impounded.
Extremely poor stability; low to medium maximum dry density; very highly erodible.	Not needed	Variable moisture-holding capacity; slow infiltration.	Very highly erodible; extremely poor stability.	Variable moisture-holding capacity; low fertility.	Impounded.
Fair stability; moderately erodible; medium to high maximum dry density.	Not needed	Moderate moisture-holding capacity; medium infiltration.	Moderately erodible; fair stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded.[2]
Poor or no stability; high shrinkage or subsidence.	Not feasible	Not feasible	Not feasible	Not feasible	Excavated.

TABLE 9.—*Engineering*

Soil series, land types, and map symbols	Soil features that affect—		
	Pipeline construction and maintenance	Road or highway location	Sites for ponds or reservoirs
Tidal marsh (Tm)	Tidal salt or brackish water flooding; very high corrosion potential; mostly very poor stability.	Tidal salt water flooding; mostly very poor stability; severe frost action.	Variable seepage; not feasible except for tidal water developments.
Westphalia WaA, WaB2, WaB3, WaC2, WaC3, WaD2, WaD3, WbB2, WbC2, WbD2, WeB2, WeC2, WeC3, and WeD3). (For properties of the Evesboro soils in mapping units WeB2, WeC2, WeC3, and WeD3, refer to interpretations in this table for Evesboro soil series.)	Slight corrosion potential; poor stability.	Poor stability; slight frost action; slope.	Seepage moderate in subsoil, high in substratum.
Woodstown (WoA, WoB2, WoC2, Wu) (Urban land in mapping unit Wu is variable and is not included in the interpretation of that unit.)	Seasonally high water table; moderate corrosion potential; good stability.	Seasonally high water table; good stability; moderate frost action.	Seepage moderate in subsoil, high in substratum.

[1] For waterways, interpretations are for surface layer only.

[2] Impounded ponds on Galestown soils and other deep sands, and on Collington and other soils that have had material removed.

Soil test data

Samples that represent 10 series were taken from 30 locations in Prince Georges County and were tested by the Bureau of Public Roads (BPR) according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*). The data obtained from these tests are given in table 6.

Table 6 also gives two systems of engineering classification for each soil sample—the AASHO system and the Unified system (*10*). These classifications are based on data obtained by mechanical analyses and by tests made to determine the liquid limit and the plastic limit.

The tests for the liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which a soil passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition. Some silty and sandy soils are nonplastic; that is, they do not become plastic at any moisture content.

Engineering descriptions of soils and estimated physical properties

A brief description of each soil of Prince Georges County is given in table 7. The table lists the symbols for most of the soils that are shown on the detailed soil map. Clay pits, Gravel and borrow pits, and Made land have such variable characteristics that they are not listed in table 7. This table also gives the engineering classification of the significant horizons of each soil. Color and other characteristics not important in engineering have been omitted; but other characteristics of the profiles are given. Also given are the kinds of underlying materials, drainage characteristics, and depth to a seasonally high water table and to bedrock, where the depth is known and is significant. Bedrock is significant only in the Glenelg and Manor soils. In these soils bedrock is at a depth of 0 to 10 feet.

The thickness and other properties given in table 7 are those that actually exist in a specific soil profile, the ones described in the section "Descriptions of the Soils." In table 7, however, horizons have been combined and do not coincide with those in "Descriptions of the Soils." In table 7, the thickness of the surface layer applies only to soils that are slightly or moderately eroded. The surface layer of severely eroded soils is thinner or may be completely removed, and the underlying horizons are closer to the surface than is indicated in the table. Also, the thickness given in table 7 for the mapping units that include urban land applies only to the part that is undisturbed. Urban land is in complexes that are listed in table 7 under appropriate soil series.

The permeability of a soil horizon is the rate at which water moves through undisturbed soil material. It depends largely on the texture and the structure of the soil.

Available water capacity is approximately the moisture held in the range between field capacity and the wilting point. It is expressed in table 7 as inches of water per inch of soil.

The reaction given in table 9 is expressed in numerical terms of pH. It is the normal reaction for that soil when it is unlimed. Soils that have been limed have higher pH values, particularly in the surface layer and upper part of the subsurface layer.

The optimum moisture is the content of moisture in percent at which the soil material can be compacted by

interpretations of soils—Continued

Soil features that affect—Continued					Suitable type of pond
Dikes, levees, and embankments	Drainage systems	Irrigation	Terraces or diversions	Waterways [1]	
Variable materials; mostly very unstable.	Not feasible	Not feasible	Not feasible	Not feasible	Excavated.
Poor stability; highly erodible; low to medium maximum dry density.	Not needed	Moderate moisture-holding capacity; rapid infiltration.	Highly erodible; poor stability.	Moderate moisture-holding capacity and fertility.	Impounded.[2]
Good stability; moderately erodible; high maximum dry density.	Moderate permeability; moderately erodible.	Moderate moisture-holding capacity; medium infiltration; impeded drainage.	Moderately erodible; good stability.	Moderate moisture-holding capacity; moderate fertility.	Impounded or excavated.

down to the sandy substratum, almost always require sealing to prevent excessive loss of water.

standard methods to maximum density, or unit weight. Maximum density is expressed in pounds per cubic foot.

The maximum dry density listed in table 9 is the density that can be expected when soil material is compacted by standard procedures at optimum moisture content. For soils in Prince Georges County, the range in dry density can be designated as low, 91 to 100 pounds per cubic foot; *medium*, 101 to 110 pounds; *high*, 111 to 120 pounds; and *very high*, 120 pounds or more.

The shrink swell potential indicates the change in volume that occurs with a change in moisture content. It is estimated primarily on the basis of the kind and amount of clay present.

Engineering interpretations

In tables 8 and 9 the properties of the soils are interpreted according to their effect on engineering work. In these tables the interpretations are for relatively undisturbed soils of their respective series. In the complexes that include Urban land, the Urban land is so variable that meaningful interpretations cannot be made without an investigation on the site. Assistance in making these investigations can be obtained from the local office of the Soil Conservation Service or from the University of Maryland, College of Agriculture.

In table 8 the soil series are rated by horizons for the suitability of their soils for engineering work and as a source of topsoil, sand, gravel, or road fill. The suitability of soil material for road fill largely depends on the density that can be obtained by compaction of the material. Density affects the rigidity, flexibility, and load-bearing properties of the soil as subgrade fill for paved roads and as surfacing material for unpaved roads. Shrink-swell is also a factor in evaluating soil material for road fill.

Table 9 lists the specific soil characteristics that affect certain engineering practices. For a particular practice, these characteristics may be favorable or unfavorable, but the characteristics that are unfavorable, or that limit the use of the soil for the specific practice, are the ones generally listed. Those who use this table should determine the specific suitability and limitation of the soil at the site of the proposed engineering work.

A soil that is suitable for one engineering purpose may be poor or even unsuitable for some other uses. For example, Hyde silt loam has very low seepage and is well suited as a site for a pond or reservoir, but it is unsuitable as a source of sand. On the other hand, the Galestown soils are a fairly good source of sand, but they are subject to excessive seepage and generally are not suitable as a site for a reservoir.

The choice of a soil suitable for the laying and maintaining of a pipeline is determined primarily by the natural stability of the soil, by the height and seasonal fluctuation of the water table, and by the potential of the soil to corrode pipes. If the water table is high, laying pipe for sewer, water, or gas is difficult and dangerous because ditchbanks are likely to collapse. In some soils ditchbanks are unstable, even when the soil is not very wet and the water table is not high. Particularly unstable in Prince George County are the Christiana soils, the Muirkirk soils, and the miscellaneous land types, Sandy and clayey land and Silty and clayey land.

In this survey, the corrosion potential given is for untreated steel pipe. Properly treated steel pipe is not significantly affected. Information on the corrosion of concrete pipe can be obtained through the office of the Soil Conservation Service at Upper Marlboro.

The choice of a soil on which to build roads or highways is affected primarily by stability of the soil, by the height of the water table and its fluctuations, by the number and duration of floods, and by the severity of frost action. Stability is especially important for roads under heavy loads or pressure. The degree of slope and changes in slope are also important considerations.

Depth to hard bedrock influences the choice of soils for pipelines, for roads or highways, and for other uses. As shown in table 9, only a few soils in Prince Georges County have bedrock that is near the surface.

The choice of a site for a pond or reservoir depends largely on the amount or rate of seepage that can be expected, particularly at the bottom of the reservoir. The amount of seepage is determined by fine or coarse material on the reservoir floor and whether it has been sufficiently compacted. Most subsoil material can be so compacted that seepage is low or very low. In many places the substrata, or material under the subsoil, are of coarser texture than the subsoil and permit greater losses by seepage. The most nearly ideal soil for the floor of a pond or reservoir is one that permits very low seepage and has a high natural water table. Also desirable for ponds is a constant or reliable source of water from the ground water, from impounded runoff, or from a stream. Such a source is especially necessary if seepage or other losses are rapid.

Stability, erodibility, and the probable maximum density affect the choice of a soil for building dikes, levees, dams, or other embankments. The maximum density to which soil material can be compacted in a dam or fill particularly affects the strength and permeability of the structure. Most earth dams allow some loss by seepage. Generally, soils that have the greatest maximum density when compacted have not only the least seepage losses but also the greatest stability and bearing value. Some soils can be easily compacted to a high or very high density, but others cannot.

The ease or difficulty with which a soil can be drained artificially is determined mainly by the permeability of the least permeable soil layer, which normally is the subsoil; by the height and fluctuation of the water table; and by the erodibility of the bottom and banks of ditches and canals. Soils that have been compacted by heavy loads, by machinery, or by other means, especially when the soils were wet, are less permeable and are more difficult to drain than the same soils in their natural condition.

Features that affect the design of an irrigation system are the rate at which water infiltrates the soil, the capacity of the soil to retain moisture, and the degree of natural drainage. Soils that have impeded drainage should be thoroughly drained artificially before an irrigation system is installed or used. In Prince Georges County, only overhead, or sprinkler, irrigation is considered. Surface or flood irrigation by ditches or conduits has not been used.

The stability and the erodibility of a soil are of special concern in planning and designing terraces and diversions. These features, as well as the water-holding capacity and natural fertility of the surface soil, strongly influence the design of waterways through fields and the kinds of grasses or other plants used in waterways.

Both excavated and impounded ponds are common in the county. An excavated pond is one that is dug out in the natural terrain. A soil suitable for an excavated pond should have a high water table. A high water table is particularly important for "sky ponds," or those that are filled by seepage and rainfall and do not receive runoff from the surrounding area. The height of water in an excavated pond usually fluctuates according to the fluctuations of the water table.

Figure 9.—**A farm pond behind an embankment built across a drainageway. The pond floor is Fallsington loam, and the embankment consists of subsoil material from that soil. The watershed is covered mostly by Westphalia fine sandy loam having variable slopes. Grass planted on the watershed helps to control erosion and protects the pond from accumulation of sand and silt.**

On soils that do not have a high water table, water normally is impounded by constructing a low dam across a drainageway (fig. 9). The floor of the pond and the dam should consist of material that has a low seepage rate, and the size of the watershed, or runoff area, should be adequate for the size and for the purpose of the pond. If the watershed is too small, little water will be impounded, and the water level may be drastically lowered during dry seasons. If the watershed is too large, runoff during especially wet periods may overtop or even destroy the dam and cause serious damage downstream.

Some soils of the county are suited to either an excavated or an impounded pond. Other soils are suited to a combination of the two and require some excavation and an impounding dam as well.

Capability Groups of Soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soils; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest grouping, are designated by Roman numerals I through VIII. As the numerals increase, they indicate progressively greater limitations

and narrower choices for practical use. The classes are defined as follows:

Class I. Soils have few limitations that restrict their use.

Class II. Soils have some limitations that reduce the choice of plants or require moderate conservation practices.

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

Class IV. Soils have very severe limitations that restrict the choice of plants, require very careful management, or both.

Class V. Soils subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Class VI. Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.

Class VII. Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Class VIII. Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to 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, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, but not in Prince Georges County, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only subclasses indicated by *w*, *s*, and *c*, because the soils in it are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–4 or IIIe–6. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation, and the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph. The Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages each capability unit in Prince Georges County is described, and use and management are discussed. The names of soil series represented are mentioned in the description of each capability unit, but this does not mean that all the soils of a given series appear in the unit. To find the names of all the soils in any given capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

CABABILITY UNIT I–4

This unit consists of nearly level, uneroded Collington, Elsinboro, and Matapeake soils. These soils are in the uplands and are deep, well drained, and medium textured. Permeability is moderately slow in the Matapeake soils and moderate in the others. All of these soils have high water-holding capacity and good natural fertility. They formed in unconsolidated materials of the Coastal Plain.

The Elsinboro soil, which formed on river terraces, has been strongly influenced by micaceous material that washed from the Piedmont.

The soils in this unit are well suited to general crops and to deep-rooted crops. Under proper management, they produce favorable yields of corn, wheat, hay, and pasture. Favorable yields of tobacco are also produced, but tobacco of better quality probably can be grown on soils having a sandier surface layer.

Although these soils may be safely tilled year after year, it is a good practice to use rotations that include untilled crops. A good rotation is one that provides at least 1 year of hay, or another untilled crop, every 4 years. Excessive water can be controlled on long slopes by farming on the contour and using grassed waterways. Turning under crop residue improves soil structure. A winter cover crop is needed when these soils are not in pasture or another crop that lasts through winter.

CAPABILITY UNIT I–5

This unit consists of nearly level Collington, Elsinboro, Marr, Matapeake, Sassafras, and Westphalia soils. These soils are in the uplands and are deep, well drained, and moderately coarse textured. Permeability is moderately slow in the Matapeake soil and moderate in the others. All of these soils have high moisture-holding capacity. They are sandy and easily tilled. They formed in Coastal Plain sediments, but the Elsinboro soil has been strongly influenced by micaceous material that washed from the Piedmont.

These soils are well suited to general crops and to deep-rooted crops. If properly managed, they produce favorable yields of truck crops, corn, hay, and pasture. For producing high-quality tobacco, they are among the best soils in Maryland.

A suitable rotation is one that provides at least 1 year of hay, or another untilled crop, after each 2 or 3 years of tilled crops. Each cultivated crop should be followed by a winter cover crop. Where the slopes on these nearly level soils are long, farming on the contour and using grassed waterways are ways of controlling runoff.

CAPABILITY UNIT I–6

This unit consists of deep, well-drained Comus and Ochlockonee soils. These nearly level soils are medium textured and moderately coarse textured. Although erosion commonly is not a problem, material is deposited by overwash or, in some places, by floods. These soils are

moderately permeable and have high moisture-holding capacity. Their natural fertility is fairly good to good, though the content of lime may be low. The Comus soil is on flood plains and is subject to occasional flooding and to streambank cutting or erosion. Also, it is strongly influenced by micaceous materials.

The soils of this unit are suited to many kinds of crops; they are especially well suited to corn, hay, and pasture. Favorable yields of medium-quality tobacco are produced on the sandier soil.

Winter cover crops are needed after row crops are harvested. For at least 1 year in every 3 or 4 years, grass or legumes are needed. Crop residue disked into the soil improves tilth, and waterways kept in sod help control runoff. Runoff from higher adjacent soils can be controlled by digging interceptor ditches along the base of the slopes or by installing diversion terraces higher up the slopes. All ditches should be kept clean.

CAPABILITY UNIT I-28

Only Monmouth fine sandy loam, 0 to 2 percent slopes, is in this capability unit. It is in the uplands and is deep, well drained, and moderately coarse textured. This soil formed in glauconitic sand and silt, locally called greensand. Although this soil is nearly level, runoff tends to be rapid because the subsoil absorbs rainwater and snowmelt slowly. Permeability is moderately slow in the subsoil. This soil has high moisture-holding capacity and good natural fertility.

This soil is suited to many kinds of crops, and it is especially well suited to tobacco, corn, hay, and pasture. A good rotation is 3 years of tilled crops followed by 1 year of hay or a green-manure crop. Following each cultivated crop with a winter cover crop is a good practice. Because runoff tends to be rapid, waterways should be kept in sod. Even where the slopes are most gentle, an occasional crop strip, interceptor, or diversion terrace is needed. Yields can be maintained at a high level by the use of fertilizer and lime.

CAPABILITY UNIT IIe-4

In this unit are gently sloping, moderately eroded Collington, Magnolia, Elsinboro, Matapeake, Sassafras, Sunnyside, and Westphalia soils. These soils are in the uplands and are deep, well drained, and medium textured. Areas are included, particularly in undisturbed woodland, where there is little or no erosion. The soils of this capability unit are moderate and moderately slow in permeability, and they have high moisture-holding capacity and good natural fertility. All of the soils formed in unconsolidated Coastal Plain materials, but the Elsinboro soil has been strongly influenced by micaceous material that washed from the Piedmont. Also, the Sassafras soil is gravelly.

The soils in this unit are well suited to general crops and to deep-rooted crops, but they erode readily where not protected by vegetation. Under good management, they produce favorable yields of corn, wheat, hay, and pasture. Favorable yields of tobacco are produced, but the quality may not be so good as that of tobacco on soils having a sandier surface layer.

Crop rotations should include hay at least 1 year in 3 or 4. Tillage should be on the contour, and contour strips are needed on all fields having long slopes. Diversion terraces may be needed to protect the soils, and sod is needed in all waterways. Following each row crop with a winter grain or a cover crop is a good practice. These soils are easily tilled, and crops on them respond well to fertilizer. Rotation grazing is beneficial where these soils are used for pasture. These soils are suitable for orchards where air drainage is adequate.

CAPABILITY UNIT IIe-5

This unit consists of nearly level and gently sloping, moderately eroded Collington, Magnolia, Elsinboro, Evesboro, Marr, Matapeake, Sassafras, Sunnyside, and Westphalia soils. These soils are deep, well drained, and moderately coarse textured. They are acid, have high moisture-holding capacity, and are productive if fertilizer is added. Permeability is moderately slow in the Magnolia and Matapeake soils and moderate in the others. All of the soils are sandy and are easily tilled. The Elsinboro soil has been greatly influenced by its content of micaceous material, and the Collington by its content of glauconitic material, or greensand. The Sassafras soil has a gravelly surface layer in places, but the gravel does not affect its suitability for crops and has little effect on tillage.

These soils are well suited to general crops and to deep-rooted crops. If properly managed, they produce favorable yields of truck crops, corn, small grain, hay, and pasture and fine-quality tobacco.

A suitable rotation is one that provides 2 years of row crops followed by 1 year of a small grain and at least 1 year of hay. Each row crop should be followed by a small grain or a winter cover crop. Because the soils in this unit erode readily unless they are protected, a plant cover is needed most of the time. These sandy soils may be somewhat droughty during long dry periods. Farming in contour strips is advisable. Diversion terraces that have a safe outlet are needed on long slopes to intercept surface runoff, and sod is needed in natural drainageways.

CAPABILITY UNIT IIe-6

This unit consists of gently sloping Ochlockonee soils that are deep and well drained. These alluvial soils are medium textured and moderately coarse textured. They are acid throughout and have moderate natural fertility. Permeability is moderate, and moisture-holding capacity is moderate to high. The hazard of erosion is moderate.

The soils of this unit are suited to many kinds of crops, especially tobacco, but the more sandy Ochlockonee soil produces tobacco of better quality. A suitable rotation is 1 year of a row crop, 1 year of a small grain, and then 1 year of hay. Crop residue turned under helps to maintain the content of organic matter. Good practices are cultivating on the contour and keeping natural drainageways in sod. If row crops are not followed by a small grain, a winter cover crop is needed.

CAPABILITY UNIT IIe-13

This unit consists of gently sloping Beltsville and Keyport soils that are moderately well drained, are medium textured, and have a very slowly permeable subsoil. These soils are moderately eroded in most places. They have moderate to high moisture-holding capacity, are strongly acid to extremely acid, and have medium natural fertility. Internal drainage is slow in the Keyport

soil because its subsoil is clayey. In the Beltsville soil a hard, dense subsoil is at a moderate depth and seasonally supports a perched water table. The internal drainage of the Beltsville soil is slow, and water moves laterally downslope toward the drainageways.

This is one of the more extensive and important capability units in Prince Georges County. The soils are suited to corn, soybeans, hay other than alfalfa, and pasture. A suitable rotation is 1 year of row crops, 1 year of small grain, and at least 1 year of hay.

Protecting the soils in this unit against erosion is more important than improving drainage, though soils are saturated during some wet periods. Unless excess water is removed early in spring, planting will be delayed. On the other hand, crops may be damaged in dry periods. Planting crops that are damaged by frost heaving is not a good practice. Yields of tobacco may be favorable, but quality tends to be low. Contour strips supplemented by diversion terraces and sodded waterways help to control runoff and erosion.

CAPABILITY UNIT IIe-16

In this unit are gently sloping, moderately eroded Adelphia, Butlertown, and Mattapex soils. These soils are deep, moderately well drained, medium textured, and medium acid to very strongly acid. Permeability is moderately slow in the subsoil. Moisture-holding capacity is moderate to high, and fertility is fairly high. The water table is seasonally high.

These soils are suited to general farm crops, hay, and pasture, but impeded drainage and a seasonally high water table somewhat limit their use for deep-rooted crops. In crop rotations a hay crop is needed at least once every 4 years. Also needed is a winter cover crop or crop of small grain after each row crop is harvested.

Although drainage is impeded in these soils, protection from erosion is more important than improving the drainage. Excess water can be controlled by farming the soils in graded strips. Natural waterways should be kept in sod. On long slopes diversions may be used for protection against erosion or to improve drainage. Planting and cultivating on these soils are generally somewhat late in spring because moisture is excessive. Tile can be used to improve drainage.

CAPABILITY UNIT IIe-25

The only soil in this unit is Manor loam, 3 to 8 percent slopes, moderately eroded. This soil is deep to bedrock, well drained to somewhat excessively drained, medium textured, and medium acid and strongly acid. It has moderate moisture-holding capacity and is moderately permeable. Natural fertility is moderate to high, but cultivated areas are highly susceptible to erosion. The substratum is loose and micaceous. Some areas are somewhat gravelly.

This soil is well suited to corn, hay, and most general crops. A suitable rotation is one that provides 2 years of row crops, 1 year of small grain, and 1 or 2 years of hay. Following each row crop with a cover crop or winter grain is a good practice. This soil is easily tilled, but contour cultivation is needed to help check erosion. Stripcropping, diversion terraces, and sodded waterways also help to control erosion.

CAPABILITY UNIT IIe-28

This unit consists of moderately eroded Howell and Monmouth soils on uplands. These soils are deep, well drained, moderately coarse textured, and medium acid to extremely acid. Permeability is moderately slow in the clayey subsoil, and runoff tends to be rapid. Moisture-holding capacity is moderate to high.

The soils of this unit are suited to general crops and to deep-rooted crops. If properly managed, they produce favorable yields of tobacco, truck crops, corn, small grain, hay, and pasture. The tobacco usually is of high quality. A suitable rotation is 1 year of row crops, followed by 1 year of small grain and then 1 year of hay. Because the subsoil is clayey and runoff is rapid, the hazard of erosion is higher than normal for soils that have gentle slopes. Contour stripcropping, diversion terraces, and sodded waterways are needed to help control erosion.

CAPABILITY UNIT IIe-29

The only soil in this unit is Howell silt loam, 0 to 6 percent slopes, moderately eroded. Some wooded areas are only slightly eroded. This soil is in the uplands and is deep, well drained, medium textured, and strongly acid to extremely acid. Permeability is moderately slow in the clayey subsoil, but internal drainage is good. The moisture-holding capacity is high.

This soil is suited to general crops and to deep-rooted crops. If lime and fertilizer are added, yields of corn, small grain, hay, pasture, and tobacco are favorable. The quality of the tobacco, however, tends to be low. A suitable rotation is 1 year of row crops, 1 year of small grain, and 1 year of hay or pasture. Because runoff is rapid and erosion is likely, clean-tilled crops should be planted only once every 3 years. Contour stripcropping, diversion terraces, and sodded waterways are needed to help check erosion. This soil is not well suited to crops that are likely to be damaged by frost heaving.

CAPABILITY UNIT IIe-36

In this unit are gently sloping Adelphia, Beltsville, Donlonton, Keyport, Matawan, Mattapex, and Woodstown soils. These soils are in the uplands. They are deep, moderately well drained, moderately coarse textured, and generally strongly acid. Erosion is moderate. Permeability is moderate to slow, moisture-holding capacity is moderate, and natural fertility is medium to low.

The soils of this unit are well suited to corn, soybeans, small grain, and hay. They should be farmed in graded rows, or in graded strips of row crops alternated with close-growing crops. Although drainage is impeded, controlling erosion is generally more important than drainage. Surface drainage can be improved and erosion lessened by farming in graded strips and by using diversion terraces to intercept runoff and to control washing on long slopes. Drainageways should be kept in sod. It is not advisable to use cultivated crops for more than 2 years out of every 3. Cover crops are needed if row crops are not followed by small grain.

CAPABILITY UNIT IIe-41

The only soil in this unit is Christiana fine sandy loam, 2 to 5 percent slopes, moderately eroded. This soil is in the uplands and is deep, well drained, moderately coarse

textured and, in unlimed areas, extremely acid. Permeability is slow in the unstable clayey subsoil material. The moisture-holding capacity is high. Internal drainage is medium.

This soil is suited to general crops. If properly managed, it produces good yields of corn, small grain, hay, and pasture. A suitable rotation consists of 1 or 2 years of row crops, 1 year of small grain, and 2 years of hay or pasture. A winter cover crop should be used if a row crop is not followed by small grain. After the sandy surface layer of this soil is saturated, runoff increases because the clay subsoil is more slowly permeable than the surface layer. Runoff and erosion can be lessened by using contour stripcropping, diversion terraces across long slopes, and sodded waterways. Tillage should be kept to a minimum.

CAPABILITY UNIT IIe-42

The only soil in this unit is Christiana silt loam, 2 to 5 percent slopes, moderately eroded. This soil is in the uplands and is deep, well drained, and medium textured. Its subsoil of unstable clay is moderately slowly permeable or slowly permeable. Internal drainage is good because cracks generally form in the unstable clay. This soil is extremely acid in unlimed areas. It has high moisture-holding capacity and is moderately productive. The surface layer, which ordinarily is fairly difficult to work, is more difficult to work where it has been compacted by heavy machines. Spring plowing may be delayed by wetness.

This soil is well suited to general crops and to deep-rooted crops. It is not suited to crops that are commonly damaged by frost heaving. If this soil is properly managed, it produces favorable yields of corn, small grain, hay, and pasture. A suitable rotation is 1 or 2 years of row crops, 1 year of a small grain, and 1 year of hay. Following row crops with a winter cover crop or a small grain is a good practice. Tillage should be kept to a minimum. Excess runoff and erosion can be controlled by using graded contour strips, sodded waterways, and on long slopes, diversion terraces. Where practical, crop residue should be kept on or near the surface by mixing only part of it into the soil.

CAPABILITY UNIT IIw-1

This unit consists of deep, nearly level Adelphia and Mattapex soils. These soils are in the uplands and are moderately well drained and medium textured. Permeability is moderate or moderately slow in the subsoil, and the water table is seasonally high. In some places the lower part of the subsoil is compact and slows the downward movement of water. These soils have moderate to high water-holding capacity, are medium acid and strongly acid, and have high natural fertility.

These soils are suited to corn, soybeans, small grain, and pasture. They are also suited to hay plants that are not subject to damage by frost heaving.

A suitable rotation is one that includes 1 or 2 years of row crops and 2 or more years of hay or pasture. Small grain can be used in the rotation, and it should follow a row crop unless a winter cover crop is used.

Improving drainage is the most important problem of management on the soils of this unit. Open ditches or diversion terraces may be needed. Tile can be used to intercept water from seepage and to drain wet spots. Tilth is improved by turning under crop residue and by keeping tillage to a minimum. On long slopes, row crops should be grown in graded strips. Cultivation may be delayed by excessive water.

CAPABILITY UNIT IIw-5

This unit consists of deep, nearly level Adelphia, Mattapex, and Woodstown soils. These soils of the uplands are moderately well drained, moderately coarse textured, and medium acid to very strongly acid. Permeability is moderate to moderately slow in the subsoil, and the water table is seasonally high. The moisture-holding capacity is moderate to high, and natural fertility is high. Erosion is no more than slight.

These soils are well suited to corn, soybeans, small grain, hay, and pasture. They are well suited to truck crops in drained areas.

A suitable rotation consists of 1 or 2 years of row crops, 1 year of a small grain, and then 1 year of hay. Following each row crop by a winter cover crop or by a small grain is a good practice. If cover crops are used, these soils can be safely cultivated for 2 or 3 years in succession.

The improvement of drainage is the most important problem of management. Drainage can be improved by digging ditches or, particularly in wet spots, by laying tile.

CAPABILITY UNIT IIw-7

This unit consists of nearly level to gently sloping Codorus and Iuka soils. These soils formed in alluvium and are deep, moderately well drained, and medium textured or moderately coarse textured. Internal drainage is impeded, and the water table is seasonally high. Some Iuka soils of this unit are in local alluvium and ordinarily are not flooded, but other soils are on flood plains and are likely to be flooded occasionally. The soils of this unit have moderate to high moisture-holding capacity and are moderately productive under good management. Unlimed areas are strongly acid to extremely acid.

The soils in this unit are suited to general farm crops, hay, and pasture. Excessive water limits use for these crops. A suitable rotation consists of 1 year of a row crop, 1 year of a small grain, and at least 1 year of hay.

Either V-type ditches or tile is suitable for improving drainage. Ditches are needed to intercept runoff and seepage from adjacent higher soils. On the more sloping soils of this unit, the hazard of erosion can be reduced by planting crops in graded strips and by using sodded waterways to dispose of runoff.

CAPABILITY UNIT IIw-8

This unit consists of nearly level Beltsville and Keyport soils. These soils are in the uplands and are moderately well drained, medium textured, and strongly acid to extremely acid. They have a very slowly permeable subsoil. Moisture-holding capacity is moderate to high, and natural fertility is moderate.

The soils in this unit are suited to corn, soybeans, hay other than alfalfa, small grain, and pasture. They are not well suited to crops that are damaged by frost heaving. A suitable rotation is 1 year of a row crop followed by 1 year of a small grain in which plants for hay have been seeded, and 1 year of hay.

The improvement of drainage, particularly early in spring, is generally the most important problem of management. These soils can be worked within only a narrow range of moisture content. The use of heavy machinery tends to compact the surface layer. Ditches are more suitable than tile for removing excess water because permeability is so slow that tile does not function properly.

CAPABILITY UNIT IIw-9

This unit consists of nearly level Beltsville, Donlonton, and Keyport soils. These soils are moderately well drained, moderately coarse textured, and strongly acid to extremely acid. In the subsoil, permeability is slow or moderately slow. The water table is seasonally high and is perched above the hard, dense subsoil in the Beltsville soil. Although water moves through these soils very slowly, runoff is slow because the soils are nearly level. Erosion is not likely. The moisture-holding capacity and natural fertility are moderate.

The soils in this unit are well suited to most crops, but use is limited by impeded drainage. Drainage is commonly improved by using random field ditches, but spot tile lines can be used where the sandy surface layer is 24 inches thick or more above the tight subsoil.

Row crops may be used for 2 years in succession, if a cover crop is grown after each crop. Row crops are commonly followed by hay. On a field having long, very gentle slopes, farming should be in graded rows, which are supplemented with diversion terraces if needed. Seepage or runoff from any adjacent higher soils should be intercepted and diverted to disposal areas.

CAPABILITY UNIT IIw-10

This unit consists of nearly level Matawan soils. These soils are deep, are moderately well drained, and have a thick sandy surface layer. Permeability is moderately slow in the subsoil, but the movement of water is moderately rapid to rapid through the thick sandy surface layer. Moisture-holding capacity is low to moderate. Unlimed areas are strongly acid to extremely acid.

The soils in this unit are generally suited to row crops, small grain, hay, and pasture. Drainage should be improved for most crops. Tile is suitable for draining these soils. A suitable rotation provides a row crop for 1 year in 2, or it provides 2 successive years of row crops followed by 2 years of hay, or by 1 year of small grain and 1 year of hay. If small grain is not planted, a winter cover crop is needed after the row crop is harvested. These soils may be somewhat droughty during long dry periods when crops on them would be benefited by supplemental irrigation. Crop residue disked into the soil increases the content of organic matter.

CAPABILITY UNIT IIs-4

In this unit are deep, nearly level to gently sloping Collington, Evesboro, and Rumford soils. These soils are in the uplands and are well drained and somewhat excessively drained. Their coarse-textured surface layer is underlain by a finer textured, moderately permeable subsoil. Most of the gently sloping areas are moderately eroded. The soils of this unit have a rapidly permeable surface layer of loamy sand or loarmy fine sand that is normally at least 20 inches thick. These soils have low moisture-holding capacity, are acid, and have low natural fertility.

217-092—67——9

The soils of this unit are suited to general crops and to deep-rooted crops. They produce tobacco and truck crops of very high quality. A suitable rotation is one in which row crops and small grain or hay are grown in alternate strips, each for 2 years. Following a row crop with a cover crop or a winter small grain is a good practice.

Supplemental irrigation is desirable on the soils of this unit because they are droughty during the drier periods in summer. In unusually dry periods, irrigation may be essential. Adequate plant cover is needed to protect the loose sandy surface layer from blowing during the windy spring months. Droughtiness and low fertility are the major problems of management on these soils, but control of erosion is also important. Contour stripcropping helps to control erosion and conserve moisture. Needed practices are sodding waterways and returning crop residue to the soil.

CAPABILITY UNIT IIs-5

The only soil in this unit is Muirkirk loamy sand, 0 to 5 percent slopes, moderately eroded. This deep, well-drained, acid soil is rapidly permeable to a depth of about 3 feet. Below that depth, permeability is slow or moderately slow. The thick surface layer has low moisture-holding capacity. Natural fertility is fairly low.

This soil is suited to general crops and to deep-rooted crops. It produces tobacco of high quality. A suitable rotation for this soil is row crops and small grain or hay, each grown in alternate strips for 2 years. Following each row crop with a cover crop or winter small grain is a good practice. Because this sandy soil is droughty during summer, supplemental irrigation is desirable. During the driest periods, irrigation may be essential. During spring good plant cover is needed to protect the loose surface layer from blowing. Droughtiness and low fertility are the major problems of management, but the control of erosion is also important. Contour stripcropping, diversion terraces, and sodded waterways are needed to help control erosion and conserve moisture. All crop residue should be disked into the soil.

CAPABILITY UNIT IIs-7

In this unit are nearly level to gently sloping Aura, Chillum, and Croom soils. These soils are in the uplands and are moderately deep, well drained or somewhat excessively drained, and medium textured. Most areas are moderately eroded. These soils have a hard or cemented subsoil. They are moderately permeable to moderately slowly permeable and are strongly acid to extremely acid. They have low to moderately high fertility and moisture-holding capacity. The tight subsoil limits the depth to which the roots of most plants can penetrate.

The soils of this unit are suited to tobacco and to general crops, hay, and pasture. They are not suited to plants requiring a very deep root zone. A 3-year rotation consisting of row crops, small grain, and hay is suitable. A winter cover crop should be grown when the soil is not in a winter small grain or grass. Because effective depth is limited by the hard subsoil, these soils may be somewhat droughty during long dry periods. At such times, crops are benefited by supplemental irrigation. Careful management is needed to conserve moisture, increase fertility, and reduce damage from erosion. Contour strip-

cropping, using diversion terraces on long slopes, and keeping waterways in sod are some of the practices needed. Crop residue should be disked into the soil.

CAPABILITY UNIT IIs-9

The only soil in this unit is Croom gravelly sandy loam, 3 to 8 percent slopes, moderately eroded. It is extremely acid in most places. This soil has low moisture-holding capacity and natural fertility. Its root zone is limited by a hard, dense, very gravelly subsoil and substratum.

This soil is suited to general farm crops and to tobacco. A suitable rotation consists of a row crop, a small grain, and hay grown in successive years. The soil is droughty and does not hold plant nutrients well. Because plants are damaged by the lack of moisture during the drier summer months, irrigation should be available if tobacco and other high-value crops are grown. Cultivation on the contour conserves moisture and helps to check erosion. Waterways should be kept in sod for the safe disposal of excess water. Cover crops and any other source of organic matter should be used.

CAPABILITY UNIT IIs-28

The only soil in this unit is Christiana fine sandy loam, 0 to 2 percent slopes. This nearly level soil is in the uplands and is deep, well drained, and moderately coarse textured. Its clayey subsoil is slowly permeable. Runoff is excessive, even on very gentle slopes, and the risk of erosion is high. This soil is easily worked if its moisture content is favorable.

This soil is well suited to many kinds of crops, but it has some limitations to use. The surface layer is easily worked, but it is thin, and plowing to a depth of more than 6 inches turns up subsoil material that contains much clay. It is difficult to work when dry and is sticky and plastic when wet. The mixing of subsoil material with the surface soil sharply decreases workability and tilth of the plow layer and worsens this layer for growing plants. Also, the clayey subsoil material slows infiltration and increases runoff. The slowly permeable subsoil slows the rate at which irrigation water can be applied safely after the plow layer becomes thoroughly wet. The roots of most plants do not penetrate far from the surface, though the roots of some go fairly deep.

CAPABILITY UNIT IIs-29

The only soil in this unit is Christiana silt loam, 0 to 2 percent slopes. Except that its surface layer is silt loam and contains very little sand, this soil is much like the soil in capability unit IIs–28.

The silt loam texture makes the range of moisture content within which this soil can be worked narrower than that of the soil in capability unit IIs–28. Also, water infiltrates this soil more slowly, and runoff is more rapid. In addition, the rate of applying irrigation water is slower on this soil. On the other hand, this soil holds more moisture available for plants. It is suited to many kinds of crops, but good management is needed for successful cultivation and the maintenance of favorable yields and good tilth.

CAPABILITY UNIT IIIe-4

In this unit are moderately sloping and strongly sloping, moderately eroded Glenelg, Magnolia, Matapeake, Sassafras, Sunnyside, and Westphalia soils. These soils are in the uplands and are deep, well drained, and medium textured. They are medium acid and strongly acid, have moderate to high moisture-holding capacity, and have medium to fairly high natural fertility. Permeability is moderately slow. The Glenelg soil is underlain by bedrock at a depth of about 10 feet in most places.

The soils in this unit are well suited to general crops and to deep-rooted crops. If properly managed, they produce favorable yields of truck crops, corn, small grain, hay, and pasture. Favorable yields of tobacco are also produced, but the quality of the crop is low or medium. A suitable rotation is one consisting of a row crop followed by a cover crop or a winter small grain and then 3 or 4 years of hay or pasture. If a clean-tilled crop is used not more than once in 4 or 5 years, losses through erosion will be strongly limited. Contour stripcropping, diversion terraces, and sodded waterways help to check further erosion.

CAPABILITY UNIT IIIe-5

This unit consists of Collington, Elsinboro, Evesboro, Marr, Muirkirk, Sassafras, Sunnyside, and Westphalia soils. These soils are in the uplands and are deep, well drained, and moderately coarse textured. Some soils in this capability unit have moderate slopes and are moderately eroded, and some have gentle slopes and are severely eroded. All the soils are medium acid and strongly acid, have moderate moisture-holding capacity, and have moderate fertility. Permeability is moderate to moderately slow. The Muirkirk soil has a thicker, sandier surface layer and a more clayey subsoil than most of the other soils.

The soils in this unit are suited to general crops and to deep-rooted crops. If properly managed, they produce favorable yields of truck crops, corn, small grain, hay, and pasture. Also, they produce tobacco of high quality.

A suitable rotation is one that provides 1 year of a row crop followed by a cover crop or a winter small grain, and then 2 or 3 years of pasture or hay. These soils are somewhat droughty during long dry periods. Contour stripcropping, diversion terraces, and sodded waterways are practices that help to control further erosion and to conserve moisture. All crop residue should be returned to the soil.

CAPABILITY UNIT IIIe-6

The only soil in this unit is Ochlockonee sandy loam, local alluvium, 5 to 10 percent slopes. It is deep, well drained, and moderately coarse textured. In most areas, it is no more than slightly eroded. Permeability and moisture-holding capacity are moderate. This soil is acid throughout and has moderate natural fertility.

This soil is suited to many kinds of crops and is highly desired for tobacco. The quality of tobacco produced is usually high, though yields may not be particularly favorable. The soil is also used for general crops and for truck crops.

A suitable rotation consists of a row crop followed by a small grain and then about 3 years of hay or pasture. The content of organic matter can be maintained by turning under crop residue. Although this soil consists of local alluvium, it is not subject to flooding. Control of erosion is the most important problem of management. Needed practices are cultivating on the

contour and sodding the natural drainageways. Excess runoff from the surrounding uplands can be intercepted and diverted to safe disposal areas. If row crops are not followed by a winter small grain, a cover crop is needed.

CAPABILITY UNIT IIIe-7

This unit consists of moderately sloping and strongly sloping, moderately eroded Aura, Chillum, and Croom soils. These soils are in the uplands and are moderately deep, well drained or somewhat excessively drained, and medium textured. They have a hard or cemented subsoil. Permeability is moderate or moderately slow. The soils in this capability unit are strongly acid to extremely acid, have low to fairly high moisture-holding capacity, and have low to high fertility. The cemented subsoil limits the depth to which the roots of most plants can penetrate.

The soils in this unit are suited to tobacco, general crops, hay, and pasture. A rotation that is suitable on these soils provides a row crop followed by a small grain, and then 2 or more years of hay. The hazard of erosion is high, and the control of erosion is generally more important than seasonal droughtiness or the restricted depth of root penetration, though the restriction influences management, use, and yield. These soils should be farmed in contour strips or graded strips, and waterways should be kept in sod. Diversion terraces are needed on long slopes in some places and crop residue should be disked into the soil.

CAPABILITY UNIT IIIe-9

The only soil in this unit is Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded. This soil is in the uplands and is shallow to moderately deep, somewhat excessively drained, and moderately coarse textured. It has a hard subsoil. It has low moisture-holding capacity, has low fertility, and is extremely acid.

This soil is fairly well suited to general crops, particularly to crops that do not require a deep root zone. A suitable rotation is one that consists of a row crop, a crop of small grain, and then at least 2 years of hay. This soil produces tobacco of high quality. It is droughty, and if tobacco and other crops of high value are grown, irrigation is needed. Although this soil is droughty and has low fertility, the most important problem of management is controlling erosion. All cultivation should be on the contour, and runoff should be controlled by diversions. Waterways should be kept in sod. Cover crops and other sources of organic matter should be used.

CAPABILITY UNIT IIIe-13

This unit consists of sloping and strongly sloping, moderately eroded Beltsville and Keyport soils. These soils are in the uplands and are moderately well drained and medium textured. They have a very slowly permeable subsoil.

The soils of this unit have moderate to fairly high moisture-holding capacity, are strongly acid to extremely acid, and have medium natural fertility. The Keyport soil of the unit has a clay subsoil, and the Beltsville soil has a hard, dense subsoil, or fragipan. Both soils have a seasonably high water table in spring, but they become very dry during hot weather. The improvement of drainage, however, is generally not so important to management as the control of erosion.

These soils are suited to general crops, but use is limited by moderate drainage, by slope, and by erosion. A suitable rotation is one consisting of a row crop, a crop of small grain, and then 2 or 3 years of hay or pasture. Runoff is especially rapid. It can be controlled and erosion lessened by using contour strips and diversions. These soils are difficult to work when they are too wet or too dry. Tillage is generally late in spring. These soils are not well suited to crops that are easily damaged by frost heaving.

CAPABILITY UNIT IIIe-25

The only soil in this unit is Manor loam, 8 to 15 percent slopes, moderately eroded. This soil is deep, well drained to somewhat excessively drained, and medium textured. It is moderately permeable and medium acid to strongly acid. The moisture-holding capacity is moderate, and natural fertility is moderate to fairly high. This soil is very micaceous. The hazard of erosion is high.

This soil is suited to general crops and is especially well suited to orchards. A good rotation is one that provides a row crop, a small grain, and then 2, or preferably 3, years of hay. This soil is easily tilled, but cultivation should be kept to the minimum needed to control erosion. Contour stripcopping and the use of alternate strips of tilled and close-growing crops are especially advisable on this soil. Waterways should be kept in sod.

CAPABILITY UNIT IIIe-28

This unit consists of sloping and strongly sloping, moderately eroded Howell and Monmouth soils. These soils are in the uplands and are deep, well drained, moderately coarse textured, and medium acid to strongly acid. Their subsoil is clayey and moderately slow in permeability. Because of this subsoil and the strong slopes, runoff is rapid and erosion is a serious hazard unless these soils are carefully protected. Internal drainage is slow, moisture-holding capacity is moderate to high, and fertility is fairly good.

These soils are suited to all general crops and to deep-rooted crops. They are well suited to orchards. If well managed, they produce favorable yields of truck crops, corn, small grain, hay, and pasture. The tobacco grown is usually of high quality.

A good rotation is one consisting of a row crop, a small grain, and then at least 2 years of hay. Erosion can be controlled by using contour stripcropping, diversions where needed, and sodded waterways.

CAPABILITY UNIT IIIe-29

The only soil in this unit is Howell silt loam, 6 to 12 percent slopes, moderately eroded. This soil is in the uplands and is deep, well drained, medium textured, and extremely acid. It has a slowly permeable clayey subsoil and fairly slow internal drainage. The moisture-holding capacity and fertility are high.

This soil is suited to general crops and to most deep-rooted crops. It produces favorable yields of corn, small grain, hay, and pasture. Tobacco produced on this soil tends to be of low quality.

A suitable rotation is one consisting of a row crop, a small grain, and then at least 2 years of hay. Runoff

is rapid and erosion likely because the penetration of rainwater or snowmelt is slowed by the clayey subsoil. Soil and water can be conserved by using contour stripcropping, diversion terraces, and sodded waterways. Crops that may be damaged by frost heaving are not well suited to this soil. The plow layer of this soil tends to be difficult to work, and a large addition of organic matter improves its tilth and workability.

CAPABILITY UNIT IIIe-33

In this unit are sloping and strongly sloping, moderately eroded Collington, Evesboro, and Rumford soils. These soils are in the uplands and are deep, well drained to somewhat excessively drained, and coarse textured. They have a moderately permeable subsoil. Their surface layer of loamy sand or loamy fine sand is as much as 20 inches thick. It is rapidly permeable and does not retain moisture very well. Moisture-holding capacity is low, and natural fertility is fairly low.

The soils in this unit are suited to general crops and to deep-rooted crops. They produce tobacco and truck crops of very high quality.

A suitable rotation is one consisting of a row crop, a small grain, and then at least 2 years of hay. The soils in this unit are subject to erosion by water and also may blow if they are dry and not protected. Soil and water are conserved by farming on the contour and keeping the soils in permanent vegetation much of the time. Supplemental irrigation is needed if truck crops, tobacco, or other crops of high value are grown.

CAPABILITY UNIT IIIe-36

This unit consists of sloping and strongly sloping, moderately eroded Adelphia, Beltsville, Keyport, Matawan, and Woodstown soils. These soils are in the uplands and are moderately coarse textured, moderately well drained, and strongly acid. Some soils of this unit have a clay subsoil; some have a dense fragipan in the subsoil; and others have a friable, readily permeable subsoil. Because of the slopes, the hazard of erosion is a more important problem of managing these soils than slow internal drainage. Runoff provides sufficient surface drainage except during the wettest periods. These soils have moderate moisture-holding capacity and low to medium natural fertility.

The soils in this unit are suited to most general crops but use is limited by slope, erosion, and internal drainage. The control of erosion is the most important problem of management, though drainage needs to be improved wherever feasible. Erosion can be controlled and drainage improved by farming in graded strips and using diversions on the long slopes. Using cover crops when a row crop is not followed by a winter small grain is a good practice. Crops subject to damage by frost heaving are not well suited to these soils.

CAPABILITY UNIT IIIe-41

In this capability unit is Sandy and clayey land and a strongly sloping, moderately eroded Christiana soil. These mapping units are in the uplands and are deep, well drained, moderately coarse textured, and extremely acid. Their subsoil of unstable clay is moderately slow to slow in permeability. The moisture-holding capacity is variable, but it is generally high. Fertility is also variable but tends to be low.

The soils of this unit are fairly well suited to general crops and to deep-rooted crops. Yields are variable but tend to be somewhat better on the Christiana soil than on Sandy and clayey land.

A rotation should include 1 year of row crops and then small grain that is followed by at least 2 years of hay or pasture. Hay and pasture plants may not grow well on the Sandy and clayey land. If tobacco is grown, a suitable rotation is 1 year of tobacco followed by 2 years of hay or another sod crop. Farming, in alternate strips, of a row crop and grain, hay, or some other close-growing crop, is a good practice. On long slopes diversions are needed. All waterways should be kept in sod. Tillage should be kept at the minimum needed for the control of weeds.

CAPABILITY UNIT IIIe-42

In this capability unit are Silty and clayey land and a strongly sloping, moderately eroded Christiana soil. These mapping units are in the uplands and are deep, well drained, and medium textured. Their subsoil is unstable clay of moderately slow to slow permeability. The soils in this unit normally have high moisture-holding capacity. They are extremely acid and have moderate to somewhat low fertility. The surface layer is easily compacted by heavy machines and in other ways, and it cannot be worked easily when it is too wet or too dry.

The soils in this unit are fairly well suited to general crops and generally have fair yields under good management. Crops readily damaged by frost heaving are not well suited to these soils.

Row crops should be followed by small grain or a cover crop and by at least 2 years of hay or pasture. Because these soils are highly susceptible to erosion, only the minimum of tillage needed for good management and weed control should be used. Needed for controlling runoff are diversions on long slopes and contour strips on all slopes. Excess water can be disposed of through sodded waterways. All crop residue should be left on the surface or partly turned under.

CAPABILITY UNIT IIIw-6

This unit consists of nearly level and gently sloping Bibb, Fallsington, Othello, and Shrewsbury soils. These soils are deep and moderately coarse textured. They are poorly drained, partly because their subsoil is moderate to moderately slow in permeability. The water table is at or near the surface in winter and spring and seldom falls to much below a depth of about 3 feet in any season. The Bibb sandy loam in this unit occurs on the flood plains and is subject to flooding. These soils are very strongly acid to extremely acid. They have moderate moisture-holding capacity and normally have moderate fertility.

Use of these soils is limited by poor drainage, but corn, soybeans, and some hay and pasture plants grow well if artificial drainage is adequate. Tile or ditches are suitable for drainage if suitable outlets are available. Runoff from the higher adjacent areas should be intercepted and diverted to safe disposal areas.

These soils can be cropped almost continuously, if cover crops are used, crop residue is returned to the soil, and

the soils lie idle every few years. In areas where Bibb soil is frequently flooded, its use is limited to grazing, woodland, wildlife habitat, and recreational purposes.

CAPABILITY UNIT IIIw-7

This extensive unit consists of nearly level and gently sloping Bibb, Colemantown, Fallsington, Hatboro, Johnston, Othello, and Shrewsbury soils. These soils are deep and medium textured. They are poorly drained, for their subsoil is moderate to moderately slow in permeability. The water table is at or near the surface in winter and early in spring, and it seldom falls to much below 3 feet of the surface in any season. The Bibb, Johnston, and Hatboro soils occur on flood plains and are subject to flooding. All the soils in this unit are extremely acid. They have high moisture-holding capacity and moderate fertility.

If drainage is adequate, the soils are suited to corn, to soybeans, and to hay and pasture plants. Small grain is seldom grown. These soils are only slightly susceptible to erosion, and they can be kept in row crops for several years, provided cover crops are used and the soil is allowed to lay fallow every few years. Either ditches or tile can be used for draining these soils. In areas where the Bibb, Johnston, and Hatboro soils are subject to frequent flooding, their use is limited mainly to grazing, woodland, wildlife habitat, or recreational use.

CAPABILITY UNIT IIIw-9

This unit consists of nearly level and gently sloping Elkton soils on upland flats and Hyde soils in depressions. These medium-textured soils are poorly drained and very poorly drained, for their subsoil is clayey and very slowly permeable. Draining these soils so that cultivated crops can be grown is difficult. These soils have high moisture-holding capacity and moderate fertility. They are strongly acid to extremely acid. The water table is at or near the surface much of the year, and seldom falls below a depth of about 3 feet. Generally, these soils are not subject to flooding, but some of the depressions do not have adequate outlets and are temporarily ponded.

After the soils in this unit are drained, they are used for corn, soybeans, and, less commonly, for hay or pasture. Tile is not suitable for drainage, and ditches must be closely spaced. Interceptors may be needed to control runoff from adjacent higher areas. If the Hyde soil is properly drained and its water table is controlled, it is well suited to truck crops and to blueberries and similar crops.

CAPABILITY UNIT IIIw-10

The only soil in this unit is Klej loamy sand. This soil is deep, nearly level, and moderately well drained. It is coarse textured throughout. Although the water table is seasonably high, this soil may be droughty during dry periods in summer. It has low moisture-holding capacity and fertility and normally is extremely acid. When the water table is low, moisture moves rapidly through this soil.

If it is adequately drained, this soil is suited to corn, soybeans, truck crops, and many other crops. During periods of drought, however, supplementary irrigation may be needed. Yields are not favorable unless good management, including heavy fertilization, is used. Row crops can be safely grown year after year if winter cover crops are seeded. This soil is fairly easy to drain, especially by tile drains.

CAPABILITY UNIT IIIw-11

The only soil in this unit is Elkton fine sandy loam, thick surface, 0 to 5 percent slopes. This poorly drained soil is in the uplands. It is extremely acid and has a thick, moderately coarse textured surface layer and a very slowly permeable clayey subsoil. Water moves rapidly through the surface layer, but it scarcely moves at all through the clayey subsoil. Moisture-holding capacity is moderate.

This soil is suited to crops that can be planted late such as corn, certain truck crops, and some hay and pasture plants. Undrained areas are normally used for grazing or as woodland. A suitable rotation normally includes a row crop for 1 year in every 3, but the more nearly level areas can be used for row crops year after year, if a winter cover crop is used.

If this soil is drained, it is moderately productive under good management. Drainage can be improved by ditches or by tile installed at the bottom of the thick, sandy surface layer. The tile does not function properly in clayey material and should not be laid in the clay subsoil. Contour tillage is needed on the short slopes, and diversions are needed on the long slopes. Waterways should be kept in sod. It is advisable to rotate grazing to keep animals off of the pastures in spring and fall when the soil is wet.

CAPABILITY UNIT IVe-3

In this unit are Silty and clayey land and strongly sloping, moderately eroded and moderately sloping, severely eroded soils of the Christiana, Collington, Howell, Matapeake, Monmouth, Sassafras, Sunnyside, and Westphalia series. The Sassafras soil is gravelly.

The soils in this unit are medium acid and strongly acid. They have moderate to fairly high water-holding capacity and fertility. Their subsoil is moderately to slowly permeable.

The soils in this unit are suited to general crops, but they cannot be safely cultivated except in rotations that provide row crops no oftener than 1 year in 5. Under intensive management, these soils produce favorable yields of truck crops, tobacco, and other crops, but the tobacco may be of low quality. The main practices needed are contour cultivation, stripcropping that includes buffer strips, minimum tillage, management of crop residue, and terracing in some places. Waterways should be closely spaced and kept in sod. These soils are well suited to permanent hay and permanent pasture, and to orchards if they are kept well sodded.

CAPABILITY UNIT IVe-5

In this unit are Sandy and clayey lands and strongly sloping, moderately eroded and moderately sloping, severely eroded soils. The soils are in the Aura, Christiana, Collington, Evesboro, Marr, Monmouth, Rumford, Sassafras, Sunnyside, and Westphalia series. All the soils are in the uplands and are deep, well drained, and coarse textured or moderately coarse textured.

The soils in this unit are medium acid to very strongly acid, are low to fairly high in moisture-holding capacity, and have low to high natural fertility. Their subsoil is moderately to slowly permeable.

The soils in this unit are suited to only occasional cultivation; clean-tilled crops must be kept to a minimum. A row crop should not be grown more than once in 5 years. These soils are well suited to most general crops, and under good management, produce favorable yields. The quality of tobacco is high to medium. Orchards kept in sod is a good use, as are hay and permanent pasture. Because the hazard of erosion is high, all protective practices that can be applied should be used. Among these practices are contour cultivation, contour stripcropping that includes buffer strips, management of crop residue, and minimum tillage. Diversion terraces are needed in places, and all waterways should be kept in sod.

CAPABILITY UNIT IVe-7

This unit consists of strongly sloping, moderately eroded and moderately sloping, severely eroded soils of the Aura, Chillum, and Croom series. These soils are moderately well drained but have a dense, hard subsoil that limits the effective depth for plant roots. They are strongly acid to extremely acid and have low to fairly high fertility and moisture-holding capacity. The hazard of erosion is high.

All the soils of this unit are suited to general crops, hay, and pasture; some are suited to tobacco. Use for cultivated crops, however, is strongly limited. It is not advisable to plant a row crop more than once in 5 years. Farming should be in narrow contour strips, and diversion terraces and sod waterways should be used. A good practice is disking the crop residue into the soil. Supplemental irrigation is beneficial during dry periods.

CAPABILITY UNIT IVe-9

The only soil in this unit is Beltsville silt loam, 5 to 10 percent slopes, severely eroded. This soil is in the uplands and is medium textured and moderately well drained. It has a dense, very slowly permeable subsoil. This soil is only moderately deep to a fragipan that supports a perched water table during wet periods. Internal drainage is very slow and is mainly downslope toward drainageways. This soil is strongly acid to extremely acid and has moderate moisture-holding capacity and fertility. Although internal drainage is impeded, the control of erosion is the most serious problem of management.

This soil is suited to hay and pasture. It is not well suited to alfalfa and other crops that may be damaged by frost heaving. Corn and other tilled crops should not be planted more often than once in 5 years. The rest of the time this soil should be used for hay, small grain, pasture, and other close-growing plants. Diversions that have crop strips between them help to control runoff and erosion and to provide the drainage needed during wet periods. Because runoff is rapid, many carefully maintained waterways and outlets are needed to prevent gullying. The waterways should be kept in permanent, well-managed sod. Compaction is likely if this soil is worked with heavy machinery, or if grazing is permitted, when the soil is wet. The compaction increases the difficulty of tilling and prevents plants from growing well.

CAPABILITY UNIT IVe-25

The only soil in this capability unit is Manor loam, 15 to 25 percent slopes, moderately eroded. This medium-textured soil is well drained to somewhat excessively drained and has moderate moisture-holding capacity and natural fertility. It is medium acid to strongly acid. Bedrock is at a depth of more than 10 feet. The content of mica is high. Included in mapping were some small areas that are gravelly and some spots that are wetter than normal.

Although this soil is suited to most crops, use for cultivation is limited by steep slopes and the risk of erosion. A good rotation is one that provides 1 year of row crops, 1 year of small grain, and then at least 3 years of hay. Another suitable rotation is a row crop, followed by a winter cover crop, and then 4 years of hay. The safest use of this soil is probably hay, permanent pasture, or orchards that are planted on the contour and kept in sod. For all crops, diversion terraces are needed to help dispose of excess runoff by channeling it into well-sodded waterways that have adequate outlets.

CAPABILITY UNIT IVw-3

In this unit are nearly level to gently sloping Leonardtown soils. These soils are in the uplands and are shallow to moderately deep, poorly drained, and medium textured. They have a hard, dense, and platelike subsoil that is slowly permeable. The dense subsoil allows little, if any, penetration by the roots of crops. In wet periods a temporary water table is perched above the hard subsoil. In sloping areas some water within these soils moves downslope, but in most areas excess water is lost naturally only through evaporation or consumption by plants. The available moisture of these soils is low during most crop years. The soils in this unit are extremely acid and have low fertility.

Drainage is needed if these soils are used for cultivated crops, and drainage can be very difficult. Pasture and hay are suitable uses, but corn and soybeans also can be grown. Corn or soybeans can be grown almost every year if they are followed by a cover crop and the cover crop is turned under to improve tilth and fertility. To prevent the puddling and packing of these soils, grazing should be avoided, or at least kept to a minimum, in wet periods. For the same reason, heavy machinery should not be used when these soils are wet. Under good management, erosion is not much of a problem, but it can be severe in sloping areas if the soil surface is not well protected. On long slopes interceptors and diversions should be used to dispose of excess water. Frost heaving may be severe on these soils.

CAPABILITY UNIT IVw-6

Only one mapping unit, Plummer and Rutlege loamy sands, is in this capability unit. These soils are on upland flats and in depressions. They are poorly drained and very poorly drained. Although water moves through these soils readily, the water table is at or near the surface much of the time unless the soils are artificially drained. In areas not drained, water stands on the surface after heavy rains or quick thaws.

These soils are very strongly acid to extremely acid and have low to very low moisture-holding capacity and fertility. The Plummer soil is in higher areas and has a dominantly gray surface layer; the Rutlege soil is in the

lower areas and has a fairly thick, almost black surface layer.

Without drainage the soils of this unit are of little use for farming. If they are adequately drained, they are suitable for corn, soybeans, blueberries, and some truck crops, and garden crops. Drainage is not difficult if outlets are adequate. Ditchbanks tend to cave and fill the ditches with sand, but tile drains usually function very well. Large amounts of fertilizer are needed for almost any kind of crop. Lime, however, should be used sparingly, for these soils are very easily overlimed. No lime at all is needed for blueberries. During dry periods irrigation is beneficial. The cost of irrigation may be justified if truck crops and other crops of high value are grown. These soils are well suited to home gardens if management is good.

CAPABILITY UNIT IVs-1

This unit consists of Galestown soils mapped separately and Galestown and Evesboro soils mapped in a complex. These nearly level to gently sloping soils are in the uplands and are deep, droughty, and sandy. They are rapidly permeable, have low moisture-holding capacity and natural fertility, and are generally extremely acid.

Although the soils in this unit are not particularly good for farming, they are suited to most deep-rooted crops. Shallow-rooted crops are also suited if supplemental irrigation is available when needed. Large amounts of fertilizer are needed for nearly all crops, but lime should be carefully applied to avoid overliming. Because costs of production are usually high and yields tend to be low on these soils, it may be economically feasible to grow only tobacco, some truck crops, and other crops of high value. The quality of the tobacco, however, is generally high, though yields may be low. Hay or another close-growing crop should be used at least once in 5 years, and to prevent washing by water and blowing by wind, a cover of vegetation is needed at all times. Contour or straight field strips are needed, and where possible, crop rows should be at right angles to the prevailing wind. These soils are benefited by using cover crops and returning all crop residue to the soil. Also needed if available are animal manure and other organic materials.

CAPABILITY UNIT VIe-2

In this unit is Sandy and clayey land and soils of the Aura, Beltsville, Christiana, Collington, Evesboro, Howell, Keyport, Marr, Monmouth, Sassafras, Sunnyside, and Westphalia series. Most of these soils are strongly sloping or steep and moderately eroded or severely eroded. This capability unit is one of the most extensive in the country. The soils in this unit are deep and well drained or moderately well drained. Otherwise, these soils have variable characteristics, but most of them are strongly acid to extremely acid.

The soils of this unit are too steep or too eroded for cultivation without intensive protective measures, which may not be feasible. Among the suitable uses are pasture, woodland, wildlife, or well-sodded orchards. If appropriate management is used, a row crop probably can be grown once in 6 years. This management provides contour stripcropping with two crops alternating in narrow strips. Also needed are many diversions, sodded waterways, and buffer strips in appropriate places. Overgrazing damages sod and promotes soil erosion.

CAPABILITY UNIT VIw-1

Only Mixed alluvial land is in this unit. This nearly level, poorly drained land type occurs throughout the county on the flood plains of streams. It is extremely acid in most areas but is variable in most other characteristics.

In some areas this land contains glauconitic materials and is somewhat more fertile than similar soils that do not. Where this land is not protected from flooding, it is suited mainly as woodland and as wildlife habitat but if it is protected and artificially drained, it should produce good pasture and some hay. The hazard of flooding is so severe that growing cultivated crops is risky, but some places may be free of floods long enough for late corn to be grown, especially corn for silage. Drainage can be improved by open ditches, and water from adjacent uplands can be intercepted by properly placed ditches. Dikes could be used to protect this land from flooding, but in farming they probably are not economically feasible.

CAPABILITY UNIT VIIe-2

In this unit are Silty and clayey land and steep and very steep soils of the Aura, Croom, Christiana, and Collington series. These soils are in the uplands and are well drained and generally severely eroded. Otherwise, their characteristics are variable.

The soils in this unit are so steep or severely eroded that they are not suited to tilled crops. A suitable safe use is woodland, but some areas probably can be pastured and used for limited grazing if care is taken to prevent overgrazing. Under especially good management, these soils may produce a limited amount of hay. These soils can be used for parks and other recreational areas.

CAPABILITY UNIT VIIe-3

The only soil in this unit is Manor loam, 25 to 60 percent slopes, moderately eroded. In most places a good cover of trees has prevented erosion on this steep soil. If the trees were removed, the loose, micaceous material probably would be washed away.

This soil is too steep for cultivation and probably should be kept wooded. Good woodland management, including selective cutting of mature and other marketable trees, should provide some economic return and at the same time adequately protect the soil against erosion. Management is needed that prevents fires and prohibits grazing of the woodland.

CAPABILITY UNIT VIIw-1

In this unit is one miscellaneous land type, Swamp. The texture of this land is variable and may be sand, silt, clay, gravel, muck, or any mixture of these materials. The surface is covered by water most, if not all, of the time.

Swamp is so wet and its reclamation is so impractical and expensive that use for farming is not likely. Some timber or other woodland products may be obtained. Swamp is suited as a habitat for some kinds of wildlife, and it could be used as a recreational area.

CAPABILITY UNIT VIIs-1

In this unit are Sandy land and moderately sloping to steep Galestown and Evesboro soils. These soils are in the uplands and are deep, excessively drained, very sandy, and extremely acid. They are extensive in the southern part of the county, but small areas occur in

many other parts. Permeability is rapid, and moisture-holding capacity and fertility are low and very low.

Because these soils are droughty, very low in fertility, and sloping to steep, they are not suitable for general cultivation. In a few local areas, however, growing valuable crops in home gardens and other local places may be justified by the high value of the crops. These soils are suitable as woodland and for limited grazing and wildlife habitats.

CAPABILITY UNIT VIIIw-1

This unit consists of only Tidal marsh. It is subject to regular flooding by saline tidewater. It is not suited to crops or pasture, and it does not support trees in its natural condition. Tidal marsh is suitable for wildlife and for fishing, boating, and other recreational activities.

CAPABILITY UNIT VIIIs-4

This unit consists of Clay pits and Gravel and borrow pits. The land in this unit has been stripped of soil material in the mining of clay and gravel or in obtaining other material for road fills or other construction.

The land in this unit is not suited to farming, but limited production of woodland products is possible if suitable areas are planted to trees. Some areas can be made into ponds, but the suitability of each area can be determined only by on-site investigation. Other areas of this land may be used as building sites, but for any use, a separate determination should be made at each site.

Tillage Practices

In this subsection tillage practices that are commonly used on the soils of Prince Georges County are discussed. How tillage is performed is important because tillage breaks down the structure of the soils, promotes the loss of organic matter, and increases the hazard of erosion. Unless soils are kept in good tilth, they do not produce favorable yields.

Figure 10.—Strips of clean-tilled crops are alternated with close-growing crops to reduce runoff and erosion on Westphalia soils.

On all soils in the county, tillage should be limited to that needed for preparing a good seedbed, for cultivating the seedlings, and for assisting crops to mature. Keeping tillage to a minimum is effective in reducing erosion and the breakdown of soil structure.

Heavy machinery used continually to cultivate corn, soybeans, or other crops compacts many kinds of soils and makes them difficult to work. Compaction is more likely to occur on the Elkton, Leonardtown, and other poorly drained, medium-textured to fine-textured soils. If the soil is a little too wet when the machines are used, the damage is more serious. Good soil structure can be restored and tillage made easier by adding organic matter and growing sod crops.

Tillage on the contour is needed on sloping soils in capability subclasses IIe, IIIe, and IVe—soils that are suitable for cultivation but that are susceptible to erosion. If row crops, or clean-tilled crops, are grown on the sloping soils in subclass IIIe and IVe, the row crops should be in contour strips that are alternated with strips of close-growing, untilled crops. Contour stripcropping on Westphalia soils is shown in figure 10.

Soil specialists have determined that, compared with tillage not on the contour, tilling sloping soils on the contour decreases by 20 to 40 percent the amount of soil lost through erosion during a crop year. They have also determined that, compared with tillage not on the contour and without field strips, stripcropping on the contour decreases by about 60 to 75 percent the amount of soil lost through erosion.

In a single field, a suitable rotation can be used if the crops making up the rotation are alternated, or staggered, on the various strips (fig. 11). The strips should be narrower on the steeper slopes than on the less sloping ones. Assistance in planning and laying out the cropping strips can be obtained through the local office of the Soil Conservation Service.

Figure 11.—**Strips of corn planted on the contour are alternated with strips of wheat that have been overseeded with a mixture of clover and redtop. This rotation is suitable for contour stripcropping. The soils are in the Westphalia-Evesboro complex, 6 to 12 percent slopes, moderately eroded.**

Drainage Groups of Soils

The soils in about 33 percent of the county requires artificial drainage of some kind. Unless drainage is provided on these soils, crop yields generally are poor and, in wet years, crops may fail completely. Many areas require artificial drainage before they can be used for community development. Only the removal of surface water is needed on about two-thirds of the acreage requiring drainage, but more intensive practices are needed on the rest.

The soils in Prince Georges County that have similar characteristics, and that require about the same kind and degree of artificial drainage, have been placed in 22 drainage groups so that suitable drainage practices can be suggested more easily. Each group differs from the others in one or more ways, but mainly in the kind and intensity of drainage practices needed.

In the discussion of each drainage group, the names of the soil series represented are mentioned, but this does not mean that all the soils of a given series are in this group. To find the names of all the soils in a particular group, refer to the "Guide to Mapping Units" at the back of this survey. The information given for the drainage groups is based on the "Drainage Guide for Maryland, Coastal Plain" (*9*). The following discussions of drainage groups will not solve the drainage problems in the county, but it will show the farmer, engineer, builder, and others what to expect in a specific area. For a particular field or other area, the details of the drainage system, especially the spacing and depth of drains, should be worked out at the site.

DRAINAGE GROUP 1.—In this group are moderately well drained, permeable Adelphia soils on foot slopes and in depressions. Drainage is impeded internally in these soils, and there is some seepage from higher areas. Tile laid in a random or patterned system probably functions very well. In the more nearly level areas, open ditches may be used instead of tile. Diversions may be needed to protect some slopes against runoff or to intercept seepage from adjacent uplands. In places surface drainage can be improved by smoothing the land. On slopes of more than 5 percent, drainage may not be needed.

DRAINAGE GROUP 2–A.—This group consists of moderately well drained Butlertown and Mattapex soils on uplands. These soils have moderately slow permeability in the lower part of the subsoil and a water table that is seasonally high. Tile laid in a random or patterned system is suitable for draining these soils. Open ditches may be used in nearly level areas. Diversions are needed to drain wet slopes, and they can be supplemented by tile or ditches in the particularly wet spots. The diversions also intercept runoff from higher areas. Sodded waterways can be added where needed for safe disposal of excess water, and adequate outlets should be constructed and maintained.

DRAINAGE GROUP 2–B.—This group consists of moderately well drained, moderately coarse textured Woodstown soils that have a permeable subsoil. These soils occur on uplands. They have a water table that is high for a brief period, and drainage is impeded in the lower part of the subsoil. Drainage systems much like those suitable for the soils in drainage group 2-A are used on these soils, but the ditches generally are more widely spaced because the subsoil is rapidly permeable. Diversions

217-092—67——10

and sodded waterways that have suitable outlets are especially important in areas that have slopes of more than 5 percent.

DRAINAGE GROUP 3-A.—In this group are moderately well drained Matawan soils that have a thick, moderately coarse textured surface layer and a thick rather tight subsoil that is finer textured than the surface layer.

The drainage problems are a high water table for brief periods and impeded drainage in the subsoil and substratum. Tile drains function very well in the soils of this group. Open ditches can be used in the nearly level areas. Diversions generally are needed on the stronger slopes, and interceptor tile or ditches may be used with the diversions. The spacing of the diversions must be determined for each field and is reduced where erosion is likely.

DRAINAGE GROUP 3–B.—The sandy Matawan soils that make up this group are similar to the soils in drainage group 3-A, but their surface layer is coarser textured and more rapidly permeable. Consequently, the soils in this group are more easily drained and do not require so widely spaced tile lines and other drains. These soils are so sandy that the ditches tend to cave.

DRAINAGE GROUP 4.—Klej loamy sand is the only soil in this group. It is coarse textured, rapidly permeable, and moderately well drained, but its lower subsoil and substratum are saturated for brief to moderately long periods when the water table is high. Tile laid in a random system generally drains this soil adequately, but ditches tend to cave. Because overdrainage may occur during dry periods, supplemental irrigation should be available in addition to an adequate drainage system.

DRAINAGE GROUP 5.—This group consists of moderately well drained Codorus and Iuka soils that are on the flood plains of streams, on foot slopes, and in depressions on the uplands. These soils have fairly uniform texture throughout. In addition to their impeded drainage, these soils have a fluctuating water table, and they receive seepage from adjacent uplands. These soils along streams are likely to be flooded. Most areas can be drained by using tile laid in a random system. Diversions are suitable in sloping areas, and all areas may need interceptors to collect seepage. Unless the soils on flood plains are protected from flooding, a drainage system is not effective. The history of flooding on a particular field or other area is helpful in estimating the probability of future flooding. This probability must be estimated for each particular field or other area.

DRAINAGE GROUP 6–1A.—This group consists of moderately well drained, medium-textured Beltsville soils. These soils have a very slowly permeable fragipan that supports a perched water table for long periods. Tile laid in these soils generally does not function properly. Ditches should be dug in a random system, and in nearly level areas, should be supplemented with tile. On the stronger slopes diversions are generally adequate if they are used with graded rows and sodded waterways. Spot drains can be used where needed. Erosion is a problem on slopes. Drainage may not be needed in a pasture or other sodded areas where the slope is more than 5 percent.

DRAINAGE GROUP 6–1B.—This group consists of moderately well drained, moderately coarse textured Beltsville soils that have a very slowly permeable fragipan in the subsoil. Except for their sandier surface layer, these soils are similar to those in drainage group 6–1A. They can be drained in about the same way, though they are easier to drain. Drainage ditches are more satisfactory than tile, and the ditches can be more widely spaced than those in the silty soils of drainage group 6–1A. Tile drains are likely to be damaged or destroyed by freezing because the tile must be laid above the fragipan to prevent sealing of the tile.

DRAINAGE GROUP 6–2A.—This group consists of moderately well drained, medium-textured Keyport soils. These soils have a very slowly permeable, clayey subsoil that impedes internal drainage. Also, the water table is high for moderately long periods. Ditches are more practical than tile, and in sloping areas they can be used with diversions and spot drains. Needed on slopes susceptible to erosion are graded crop rows, graded crop strips between the diversions, and suitable waterways with suitable outlets. Slopes of more than 10 percent may not require artificial drainage.

DRAINAGE GROUP 6–2B.—This group consists of moderately well drained, moderately coarse textured Donlonton and Keyport soils that have a clayey subsoil. The surface layer of these soils is sandier than that of the soils in drainage group 6–2A. Drainage problems are about the same on these soils as they are on the soils in drainage group 6–2A, though drainage is easier. Ditches are more suitable for drainage than tile, and they can be more widely spaced than in the siltier soils of drainage group 6–2A.

DRAINAGE GROUP 7–A.—In this group are poorly drained, medium-textured Fallsington and Shrewsbury soils that have a subsoil of permeable to moderately slowly permeable sandy clay loam. Their substratum is sandy. Internal drainage is not impeded by the soil material in these soils, but a high water table keeps the soil wet for short to long periods. These soils can be drained by using a patterned system of tile. The tile lines should be spaced to fit the individual field. Tile also may be used to intercept seepage from higher adjacent areas. Shallow ditches can be used, but if they are dug into the loose, sandy substratum, there may be undercutting and caving. Also, the sand tends to flow along the ditch bottom (fig. 12).

DRAINAGE GROUP 7–B.—In this group are poorly drained, moderately coarse textured Fallsington and Shrewsbury soils. These soils have a subsoil of moderately permeable to slowly permeable sandy clay loam and a substratum that is sandy. Except that their surface layer is coarser textured, these soils are like the soils in drainage group 7–A, and they can be drained in about the same way. In the soils of this group, however, tile lines can be more widely spaced.

DRAINAGE GROUP 8–1A.—In this group are poorly drained Othello soils that have a slowly permeable subsoil of heavy silt loam or silty clay loam. The water table, which stays high for long periods, creates the main problem of drainage. Ditches generally are more suitable than tile because water entering the tile is slowed by the medium-textured subsoil. Graded rows can be used for crops, and bedding may be needed between field ditches. In hummocky or other uneven areas, it may be helpful to smooth the land before it is drained. Ditches may be used to collect runoff or seepage from adjacent areas.

DRAINAGE GROUP 8–2B.—In this group are poorly drained Colemantown and Elkton soils that have a medium-textured surface layer and a very slowly permeable

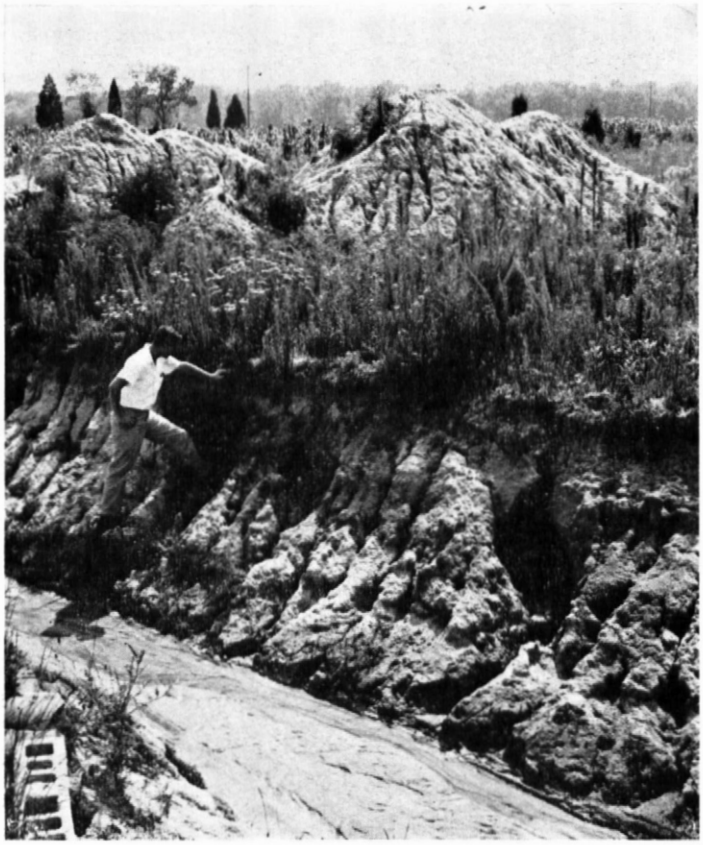

Figure 12.—**A drainage ditch in a Fallsington soil. The banks have been undercut in places, and sand flows along the bottom of the ditch.**

subsoil. A water table that is high for long periods creates the main problem of drainage. In draining these soils, open ditches are preferred to tile because the slowly permeable subsoil prevents tile from functioning properly. Bedding is commonly used, and in some places land smoothing is also required. Graded rows are suitable for corn and other row crops. The soils in this group are among the most difficult to drain in the county. In some places field ditches must be closely spaced if drainage is to be adequate.

DRAINAGE GROUP 8–2C.—Elkton fine sandy loam, thick surface, 0 to 5 percent slopes, is the only soil in this group. This soil has a moderately coarse textured surface layer and a clayey subsoil that is very slowly permeable. The surface layer is thicker and sandier than that of the soils in drainage group 8–2B. Consequently, this soil is somewhat easier to drain, and ditches need not be spaced so closely. In other respects, the drainage practices required are like those for the soils in group 8–2B.

DRAINAGE GROUP 8–3A.—In this group are poorly drained Leonardtown soils. These soils have a very slowly permeable hardpan below a medium-textured subsoil. The fragipan supports a perched water table that is at or very near the surface during wet periods. Tile would have to be laid within the fragipan to prevent freezing, and in this position, it would function poorly because it would soon be sealed off from the water table. For this reason, and because the fragipan has platy structure, ditches are preferred to tile. Most of the water moves laterally over or through the platy fragipan until it reaches the ditches. The spacing of the tile should be determined in each field or other area.

DRAINAGE GROUP 9–1.—Plummer and Rutlege loamy sands are the only soils in this drainage group. These poorly drained and very poorly drained soils are sandy throughout. Their soil material does not impede drainage, but the water table is high or very high. Either tile or ditches are suitable for drainage, but the ditches tend to cave and clog. These soils generally are in depressional areas that may become ponded if there are no adequate outlets. Overdrainage is possible in dry seasons because these soils are sandy throughout.

DRAINAGE GROUP 9–6B.—Hyde silt loam is the only soil in this group. This soil occurs in depressions and is very poorly drained. Its thick surface layer is high in organic-matter content, and its subsoil is clayey and very slowly permeable. The water table is very high for short periods. If this soil is drained, suitable outlets must be provided in the depressions. V-type ditches can be used. Bedding is needed between the ditches, and plantings should be in high rows where crops are grown. In some places, draining this soil may not be economical.

DRAINAGE GROUP 11–A.—This group consists of poorly drained and very poorly drained, medium-textured soils on the flood plains. These are soils in the Bibb, Hatboro, and Johnston series. The hazard of flooding is definite but unpredictable. Also, water seeps from adjacent uplands, and there are long periods when the water table is very high. The soils in this group can be drained by V-type ditches and tile, but drainage may be ineffective unless the soils are protected from flooding. V-type ditches generally are satisfactory on the nearly level flood plain. Tile can be used to intercept seepage from adjacent uplands. Only by studying the history of flooding in a particular tract can the hazard of flooding be estimated. Recent changes in land use must be considered, as well as changes in the pattern of runoff and in the watershed upstream.

DRAINAGE GROUP 11–B.—Bibb sandy loam is the only soil in this group. This soil is much like the soils in drainage group 11–A, but it is less likely to be flooded, is more sandy throughout, and is more easily drained. The soils in both groups require about the same kind of drainage, but in Bibb sandy loam the spacing between the V-type ditches can be wider. The hazard of flooding should be determined for each field or other area.

DRAINAGE GROUP 12.—Only Mixed alluvial land is in this drainage group. This land is on flood plains that are frequently flooded. The texture of the soil material varies a great deal and may be silty, clayey, or gravelly within short distances. Natural drainage also varies, but most areas are poorly drained. This land is drained only in local areas where it is used for pasture or some other use of low intensity. Field ditches are suitable, and interceptor ditches may be used below uplands to collect seepage or runoff. Dikes and levees may be needed to control flooding.

Irrigation Groups of Soils

Rainfall in Prince Georges County is generally adequate for agriculture, but it is not always well distributed

Figure 13.—**This is a good illustration of what is, and what is not, conservation irrigation. The soil in the background and to the left is Rumford loamy sand, 2 to 5 percent slopes, moderately eroded, in irrigation group 3. It can absorb nearly an inch of water per hour. The soil in the foreground is Woodstown sandy loam, 0 to 2 percent slopes, in irrigation group 9. It can absorb only slightly more than one-half inch of water per hour. Water is being applied too rapidly on the Woodstown soil, is wasted, and may damage the young bean crop or the soil.**

during the growing season. Extended dry periods frequently occur between June and September. As a result, many crops and pastures are damaged, particularly those on soils that are low in moisture-holding capacity. If an adequate irrigation system is installed, and enough water is readily available during dry periods, crop yields would not be drastically reduced.

In this subsection general practices of irrigation are discussed, and then groups of soils suitable for conservation irrigation are described. Conservation irrigation is application of water in amounts needed to maintain a good growth of crops, but without waste of water and without damage to the soil or to the crops. Because sprinkler irrigation is the only method of irrigation suitable in Prince Georges County, all reference to irrigation in this report is to sprinkler irrigation (fig. 13).

This subsection should be used as a general reference, not as a guide for the design of sprinkler irrigation systems. Information in this section will not take the place of investigation at the site of a planned irrigation system. Assistance in designing and installing an irrigation system can be obtained from specialists of the Soil Conservation Service.

Conservation irrigation should be a part of a complete farm program of soil and water conservation. Because irrigation is expensive, it can be economically used only on soils that are highly productive and that can be made more productive by irrigation. These soils need to be liberally fertilized and adequately limed. The cropping system should include crops that help to control erosion, to minimize leaching, to maintain good tilth, and to furnish organic matter.

To be suitable for irrigation, soils must have good drainage. Some moderately well drained and poorly drained soils are included in the irrigation groups, but they should be artificially drained if they are irrigated. Soils that are very poorly drained are not included.

To be successful, irrigation must meet the needs of both crops and soils. Different crops need different amounts of water applied at different intervals. Some soils hold much water; others hold only a little; some soils absorb water readily, and others absorb it more slowly. If water is applied more rapidly than it can be absorbed, crops may be damaged.

In this survey, crops are classified into three groups according to their average depth of rooting. The shallow-rooted crops include beets, broccoli, cabbage, cauliflower, celery, cucumbers, lettuce, onions, peas, spinach, snap beans, and strawberries. The moderately deep-rooted crops are eggplant, grasses grown for hay or pasture, Irish potatoes, lima beans, melons, peppers, pumpkins, soybeans, squash, sweet corn, sweetpotatoes, and tobacco. In the earlier part of the growing season, tobacco and other crops that are transplanted from seedbeds should be considered shallow-rooted crops. The deep-rooted crops commonly grown in the county are alfalfa, corn, tomatoes, and fruit and nut trees.

In the following paragraphs the irrigation groups in Prince Georges County are discussed. The names of soil series represented are mentioned in the description of each irrigation group, but this does not mean that all the soils of a given series appear in this group. To find the names of all the soils in any given group, refer to the "Guide to Mapping Units" at the back of this survey. Also, given for each group is the rate at which water can be applied to cultivated and sodded land without waste and without damage to the soil and the depth to which the soils should be irrigated for shallow-rooted crops, moderately deep-rooted crops, and deep-rooted crops. In addition, the amount of water that the soils can hold is given. Most of the soils in each group can be irrigated in about the same way. The maximum rate at which water can be applied is given only for level or nearly level land. The rate of water application must be decreased as the slope increases.

The range of the maximum rate of irrigation, the water-holding capacity of the soils, and the suggested depths to which irrigation water should be applied for shallow- and deep-rooted plants are estimates based on field trials and the judgment of engineers, agronomists, and soil scientists. As more precise data are obtained, revisions will be supplied as necessary.

IRRIGATION GROUP 1.—In this group are the sandiest soils in the county. These soils are in the Evesboro, Galestown, Klej, Matawan, Plummer, and Rutlege series. The Klej and Matawan soils are only moderately well drained and need improvement of drainage before most crops are irrigated. The Plummer and Rutlege soils are poorly drained and must be artificially drained before they are suitable for irrigation.

On nearly level land, the soils in this group can be irrigated at a rate of about 1 inch per hour, and they hold about 1 inch of water per foot of soil. For most crops, irrigation water should be applied to a depth of about 2 feet, but for shallow-rooted crops, water should be applied to a depth of about 18 inches. Some deep-rooted crops may be irrigated to a depth of about 3 feet.

IRRIGATION GROUP 2.—This group is made up of Muirkirk soils that have a light loamy sand surface layer and a clayey subsoil at a depth of 20 inches or more.

The soils in this group absorb water readily, but the clayey subsoil slows the downward movement of water. On nearly level land, water should be applied at a maximum rate of about 0.8 of an inch per hour in cultivated areas and at about 1 inch per hour in sodded areas. The rate of water application must be reduced on the stronger slopes. These soils can be irrigated to a depth of about 20 inches, and they hold about 1 inch of water per foot of soil.

IRRIGATION GROUP 3.—In this group are Collington, Evesboro, and Rumford soils that have loamy sand surface layer and a friable subsoil. The subsoil is generally sandy clay loam at a depth of little less than 20 inches.

On level land, water can be applied at a rate of about 0.9 of an inch per hour in cultivated areas and 1 inch per hour in sodded areas. The surface layer holds about 1 inch of water per foot of soil, and the subsoil holds about 2 inches per foot of soil. Shallow-rooted crops should be irrigated to a depth of about 18 inches, and the deep-rooted crops should be irrigated to a depth of about 26 inches.

IRRIGATION GROUP 4.—This group is made up of moderately well drained Matawan soils that have a fine sandy loam surface layer about 20 inches thick and a much finer textured subsoil. For most crops, these soils need improvement of drainage before they are irrigated.

The rate of water application should be no more than about 0.7 of an inch per hour in level cultivated areas, but it can be increased to about 1 inch per hour in sodded areas. The soils in this group are difficult to irrigate to a depth of more than about 2 feet. They will hold about 1.6 inches of water per foot of soil to a depth of about 2 feet. The shallow-rooted crops should be irrigated only to a depth of about 18 inches, but all other crops can be irrigated to a depth of about 24 inches.

IRRIGATION GROUP 5.—In this group are Sandy and clayey lands and soils of the Christiana, Howell, and Monmouth series. All of these soils have a sandy loam surface layer and a firm, fine-textured layer at a depth of 10 inches or less.

The soils in this group have a fairly permeable surface layer, but their subsoil is firm and clayey, one through which water moves at a very slow rate. On nearly level land, the maximum rate of irrigation ranges from about 0.3 of an inch per hour in cultivated areas to about 0.5 of an inch per hour in sodded areas. The rate of water application needs to be reduced on the stronger slopes. The first foot of soil will hold about 1.7 inches of water, and the second foot will hold about 2.3 inches. Water should be applied to a depth of about 18 inches for most crops, to a depth of about 12 inches for shallow-rooted crops, and to a depth of about 24 inches for deep-rooted crops.

IRRIGATION GROUP 8.—This group consists of moderately well drained Beltsville, Donlonton, and Keyport soils and a poorly drained Elkton soil. The moderately well drained soils need improvement of drainage before most crops are irrigated. The poorly drained soil must be artificially drained before it is suitable for irrigation. The soils in this group have a surface layer of fine sandy

loam. At a depth of about 20 inches a hardpan or a layer of fine clay restricts the movement of water and the penetration of roots.

On the soils in this group, water must be applied slowly so it will have time to penetrate the soil underlying the sandy surface layer. On level land, the maximum rate of irrigation ranges from about 0.3 of an inch per hour in cultivated areas to about 0.6 of an inch per hour in sodded areas. The top 12 inches of soil will hold about 1.7 inches of water, and the next 8 inches will hold about an additional 1.3 inches of water. Attempts to irrigate to a depth of more than about 20 inches are not successful. Shallow-rooted crops generally need to be irrigated to a depth of only about 12 inches.

IRRIGATION GROUP 9.—This group consists of soils of the Adelphia, Aura, Collington, Croom, Elsinboro, Evesboro, Fallsington, Magnolia, Marr, Matapeake, Mattapex, Othello, Sassafras, Shrewsbury, Sunnyside, Westphalia, and Woodstown series. The Adelphia, Mattapex, and Woodstown soils are only moderately well drained and need improvement of drainage before most crops are irrigated. The Fallsington, Othello, and Shrewsbury soils are poorly drained and require artificial drainage before they are suitable for irrigation. The soils in this group have a surface layer of sandy loam or fine sandy loam, a subsoil of friable sandy clay loam to light silty clay loam, and in some areas a compact subsoil or substratum.

On level land, the suggested rate of water application is 0.6 of an inch per hour in cultivated areas and 1 inch per hour in sodded areas. The water-holding capacity is about 1.7 inches for the first foot of soil and about 2 inches per foot in the subsoil. Most crops should be irrigated to a depth of 20 to 24 inches, but irrigating to a depth of 12 or 15 inches should be sufficient for some shallow-rooted crops. Some very deep-rooted plants, such as alfalfa or fruit trees, may be irrigated to a depth of 27 inches.

IRRIGATION GROUP 10.—This group is made up of soils of the Bibb, Codorus, Comus, Hatboro, Iuka, Manor, and Ochlockonee series. These soils have a uniformly medium texture from the surface to a depth of 36 inches or more. In Prince Georges County the Bibb, Codorus, Hatboro, and Iuka soils are on flood plains and must be protected from floods during the crop year if they are irrigated. The Bibb and Hatboro soils are poorly drained and must be artificially drained before they are suitable for irrigation. The Codorus and Iuka soils are only moderately well drained and need improvement of drainage before most crops are irrigated.

Irrigation water can be applied at a fairly rapid rate on these soils. On level land the maximum rate of irrigation is about 0.5 of an inch per hour in cultivated areas and about 0.8 of an inch per hour in sodded areas. Except for the Manor soils, most of the soils in this group are level or nearly level and will hold about 2 inches of water per foot of soil to a depth of at least 3 feet. Most crops should be irrigated to a depth of 18 to 24 inches, but some shallow-rooted crops may need to be irrigated only to a depth of about 12 inches. The very deep-rooted crops should be irrigated to a depth of at least 27 inches.

IRRIGATION GROUP 10A.—This group consists of soils in the Bibb, Iuka, and Ochlockonee series. These soils are more sandy throughout the profile than are the soils in group 10, and they have a lower moisture-holding capacity and water infiltrates more rapidly. The Iuka soils are only moderately well drained and need improvement of drainage before most crops are irrigated. The Bibb soil is poorly drained and must be artificially drained before it is suitable for irrigation.

On level land, irrigation water should be applied at a rate of about 0.7 of an inch per hour in cultivated areas and about 1 inch per hour in level areas. The soils in this group will hold about 1.6 inches of water per foot of soil to a depth of at least 3 feet. Most crops grown on these soils should be irrigated to a depth of 21 to 24 inches, but deep-rooted crops may be irrigated to a depth of 30 inches and shallow-rooted crops to a depth of 15 inches. Some of the soils are on flood plains and need to be protected if they are irrigated.

IRRIGATION GROUP 11.—In this group are medium-textured Aura, Beltsville, Chillum, and Croom soils that have a fragipan or a hard layer at a depth of 20 to 30 inches. The Beltsville soils are only moderately well drained and need improvement of drainage before most crops are irrigated.

On level land, the rate of water application should be about 0.3 of an inch per hour in cultivated areas and about 0.6 of an inch per hour in sodded areas. The water-holding capacity is about 2 inches per foot of soil. Shallow-rooted crops should be irrigated to a depth of 12 to 15 inches, and all other crops to a depth of 18 or 24 inches. Attempting to irrigate to a depth of more than 2 feet is not beneficial.

IRRIGATION GROUP 12.—In this group are Silty and clayey lands and soils of the Christiana, Colemantown, Elkton, Howell, and Keyport series. These soils have a surface layer of loam or silt loam and a firm, clayey layer or a fragipan at a depth of 10 inches or less. The Keyport soils are only moderately well drained and need improvement of drainage before most crops are irrigated. The Colemantown, Elkton, and Leonardtown soils are poorly drained and must be artificially drained before they are suitable for irrigation.

Irrigation water must be applied very slowly on these soils, as it does not penetrate rapidly. On level land, the maximum rate of irrigation is about 0.3 of an inch in cultivated areas and about 0.4 of an inch per hour in sodded areas. The soils in this group hold about 2 inches of water per foot of soil. Most crops should be irrigated to a depth of about 18 inches, but shallow-rooted crops need to be irrigated only to a depth of about 12 inches. Attempts to irrigate to a depth greater than 24 inches would take a long time and generally are not practical or beneficial.

IRRIGATION GROUP 13.—The soils in this group have a medium-textured surface layer and a friable sandy clay loam to light silty clay loam subsoil below a depth of about 10 inches. They are in the Adelphia, Butlertown, Collington, Elsinboro, Fallsington, Glenelg, Magnolia, Matapeake, Mattapex, Othello, Sassafras, Shrewsbury, Sunnyside, and Westphalia series. The Adelphia, Butlertown, and Mattapex soils are only moderately well drained and need improvement of drainage before most crops are irrigated. The Fallsington, Othello, and Shrewsbury soils are poorly drained and must be artificially drained before they are suitable for irrigation.

The soils in this group hold about 2 inches of water per foot of soil. The rate of water application is 0.4 of an

inch per hour on level cultivated land and about 0.7 of an inch per hour on level sodded land. Most crops should be irrigated to a depth of 18 to 24 inches, but shallow-rooted crops may need to be irrigated only to a depth of 12 to 15 inches. Deep-rooted crops can be irrigated to a depth of about 27 inches.

IRRIGATION GROUP 14.—This group consists of soils that contain a large amount of clay in their surface layer and generally have a finer textured subsoil. These soils are in the Christiana, Howell, Monmouth, and Sunnyside series. They have been severely eroded, but are suited to cultivated crops planted in long rotations if intensive practices are used.

Because irrigation water must be applied so slowly, irrigating the soils in this group may not be feasible except in areas used for special crops. On level land, the maximum rate of irrigation ranges from about 0.2 of an inch per hour in cultivated areas to about 0.4 of an inch per hour in sodded areas. Because these soils have slopes ranging from 5 to 12 percent, the rate of water application should be slower than the rates given. The soils in this group hold about 2 inches of water per foot of soil. The shallow-rooted crops should be irrigated to a depth of about 12 inches. Most of the other crops should be irrigated to a depth of about 18 inches, but a few deep-rooted crops, such as alfalfa or orchards, may be irrigated to a depth of about 24 inches.

Estimated Yields

The soils of Prince Georges County vary a great deal in productivity. Some of them consistently produce fairly high yields of most cultivated crops. Others, though suitable for cropping, produce lower yields. Some soils are better suited to less intensive use.

Estimates of yields of specified general crops on most soils in the county, under two levels of management, are shown in table 10. The soils in the urban land complexes are not listed because they are not used for farming. Clay pits, Gravel and borrow pits, Made land, Swamp, and Tidal marsh are not listed because they are not suitable for cultivation. In columns A are estimated average yields, per acre, obtained under the management commonly used in the county. In columns B are estimated average acre yields under improved management. The yields and quality of tobacco are given in table 12. Nearly all tobacco in Prince Georges County is grown under a high level of management.

According to the reports of the U.S. Census of Agriculture, in 1959, the average yield of tobacco, per acre, in Prince Georges County was 801 pounds. Other average yields reported were 44 bushels of corn, 17 bushels of wheat, 18 bushels of soybeans, and 1.8 tons of hay.

To obtain the estimated yields shown in columns B of table 10 most, if not all, of the following practices should be used.

1. Contour tillage, stripcropping, terracing, minimum tillage, or similar measures are used where needed to help control erosion; the soils that need drainage are drained; excess water is disposed of safely; and irrigation is supplied to the soils that need it.
2. Rotations are of adequate length and generally consist of a tilled crop to help control weeds, a deep-rooted crop to improve the permeability and structure, a legume for 1 year or more to help maintain or improve fertility, and a close-growing crop or a green-manure crop to help improve soil structure and tilth, to supply organic matter, and to help control erosion.
3. Manure and crop residue are turned under to supply nitrogen, other nutrients, and organic matter so that the physical condition of the soil is improved and erosion is reduced.
4. Fertilizer and lime are applied according to the needs indicated by soil tests; the county agent may be consulted about making the tests.
5. The soils are cultivated as little as possible, but suitable methods of plowing, preparing the seedbed, and cultivating are used.
6. Planting, cultivating, and harvesting are done at the proper time and in the proper way.
7. Weeds, diseases, and insects are controlled.

The yields shown in column B are not presumed to be the highest yields obtainable, but they set a goal that is practical for most farmers to reach if they use good managment. Yields on the same soil can be expected to vary because of differences in the kind of management, in the weather, in the crop varieties used, and in the numbers and kinds of insects and diseases. However, the yields under improved management should not vary more than 10 percent from those given in column B of table 10.

When selecting a soil on which tobacco is to be grown, both the quantity and the quality of the tobacco should be considered. The soils that have a surface layer of loam or silt loam or that are only moderately well drained may produce large amounts of tobacco, but the quality tends to be low. The very light sandy soils, which are droughty and low in fertility, may produce only low yields, but the quality of the tobacco tends to be much better than that grown on the more fertile, finer textured soils. The cropping history and the management of the soils also affect the quality and the yield of tobacco.

More information about management practices needed to obtain good yields can be found in the subsection "Capability Groups of Soils." Practices applied in irrigation and drainage of soils are described in other subsections of "Use and Management of Soils."

Woodlands [4]

Practically no virgin forest remains in Prince Georges County. According to the U.S. Census of Agriculture, about 17 percent of the county was used as woodland in 1959. In that year the income from the sale of standing timber amounted to about $65,000 in Prince Georges County.

Hardwoods dominate in the woodlands of the county, and they probably always have. On the better drained soils, the hardwoods are mostly oaks, and oaks make up a large proportion of the hardwoods on the wetter soils. Much of the timber harvested has been of oak or yellow-poplar. Other hardwoods common in the county are

[4] Prepared with the assistance of A. R. BOND, assistant State forester, Maryland Department of Forests and Parks, and SILAS LITTLE, JR., forester, Northeastern Forest Experiment Station, U.S. Forest Service.

TABLE 10.—*Estimated average acre yields of principal crops*

[Yields in columns A are those obtained under management commonly used in the county; those in columns B, under improved management. Absence of figure indicates crop is not suited to the soil specified or is not commonly grown on it]

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
AdA	Adelphia fine sandy loam, 0 to 2 percent slopes.	55	115	25	45	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
AdB2	Adelphia fine sandy loam, 2 to 5 percent slopes, moderately eroded.	55	115	25	45	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
AdC2	Adelphia fine sandy loam, 5 to 10 percent slopes, moderately eroded.	50	110	20	40	-----	-----	1. 6	3. 0	80	220	1, 100–1, 500	Medium.
AhA	Adelphia silt loam, 0 to 2 percent slopes.	55	115	25	45	20	40	1. 6	3. 0	80	230	1, 500	Low.
AhB2	Adelphia silt loam, 2 to 5 percent slopes, moderately eroded.	55	115	25	45	20	40	1. 6	3. 0	80	230	1, 500	Low.
AuB2	Aura gravelly loam, 2 to 6 percent slopes, moderately eroded.	35	90	12	30	12	30	1. 0	2. 5	50	140	700–1, 500	Medium.
AuC2	Aura gravelly loam, 6 to 12 percent slopes, moderately eroded.	30	80	10	25	-----	-----	. 9	2. 3	45	130	700–1, 500	Medium.
AuC3	Aura gravelly loam, 6 to 12 percent slopes, severely eroded.	25	75	8	25	-----	-----	. 8	2. 1	40	110	700–1, 500	Medium.
AuD	Aura gravelly loam, 12 to 20 percent slopes.	30	75	10	25	-----	-----	. 8	2. 2	40	115	----------	
AvE	Aura and Croom gravelly loams, 20 to 50 percent slopes.	-----	-----	-----	-----	-----	-----	-----	1. 8	30	85	----------	
BeA	Beltsville fine sandy loam, 0 to 2 percent slopes.	30	75	10	25	10	25	. 8	2. 1	45	135	700–1, 500	Medium.
BeB2	Beltsville fine sandy loam, 2 to 5 percent slopes, moderately eroded.	30	75	10	25	10	25	. 8	2. 1	45	135	700–1, 500	Medium.
BeC2	Beltsville fine sandy loam, 5 to 10 percent slopes, moderately eroded.	25	70	8	25	-----	-----	. 7	1. 9	40	125	700–1, 500	Medium.
BlA	Beltsville silt loam, 0 to 2 percent slopes.	40	80	15	30	15	30	1. 2	3. 0	65	170	1, 100–1, 500	Low.
BlB2	Beltsville silt loam, 2 to 5 percent slopes, moderately eroded.	40	80	15	30	15	30	1. 2	3. 0	65	170	1, 100–1, 500	Low.
BlC2	Beltsville silt loam, 5 to 10 percent slopes, moderately eroded.	35	70	13	30	-----	-----	1. 0	2. 8	55	160	1, 100–1, 500	Low.
BlC3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded.	30	65	11	25	-----	-----	. 8	2. 5	50	140	1, 100–1, 500	Low.
BlD3	Beltsville silt loam, 10 to 15 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	. 6	2. 0	45	125	----------	
Bn	Bibb sandy loam	40	90	20	30	20	30	1. 3	2. 3	65	170	----------	
Bo	Bibb silt loam	45	100	25	35	25	35	1. 7	2. 6	85	200	----------	
BtB2	Butlertown silt loam, 0 to 5 percent slopes, moderately eroded.	45	85	15	35	15	35	1. 2	3. 0	70	180	>1, 500	Low.
CaB2	Chillum silt loam, 0 to 6 percent slopes, moderately eroded.	65	125	25	45	25	45	1. 8	3. 3	90	250	1, 100–1, 500	Low.
CaC2	Chillum silt loam, 6 to 12 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1. 7	3. 1	85	230	1, 100–1, 500	Low.
CaC3	Chillum silt loam, 6 to 12 percent slopes, severely eroded.	50	105	20	35	-----	-----	1. 5	3. 0	75	210	1, 100–1, 500	Low.
CaD2	Chillum silt loam, 12 to 20 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1. 6	3. 1	80	220	1, 100–1, 500	Low.
CcC3	Christiana clay, 5 to 10 percent slopes, severely eroded.	35	90	12	30	-----	-----	1. 1	2. 8	55	210	700–1, 100	Low.
CcD3	Christiana clay, 10 to 15 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	. 9	2. 3	50	175	----------	
CcE3	Christiana clay, 15 to 35 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	-----	1. 8	-----	130	----------	
CdA	Christiana fine sandy loam, 0 to 2 percent slopes.	45	115	15	40	15	40	1. 3	3. 1	65	230	700–1, 100	Medium.
CdB2	Christiana fine sandy loam, 2 to 5 percent slopes, moderately eroded.	45	115	15	40	15	40	1. 3	3. 1	65	230	700–1, 100	Medium.

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
CdC2	Christiana fine sandy loam, 5 to 10 percent slopes, moderately eroded.	40	105	13	35	------	------	1. 2	2. 9	60	210	700–1, 100	Medium.
CdD2	Christiana fine sandy loam, 10 to 15 percent slopes, moderately eroded.	40	100	13	35	------	------	1. 2	2. 9	60	210	700–1, 100	Medium.
CeA	Christiana silt loam, 0 to 2 percent slopes.	45	115	15	40	15	40	1. 3	3. 1	65	230	700–1, 100	Low.
CeB2	Christiana silt loam, 2 to 5 percent slopes, moderately eroded.	45	115	15	40	15	40	1. 3	3. 1	65	230	700–1, 100	Low.
CeC2	Christiana silt loam, 5 to 10 percent slopes, moderately eroded.	40	105	13	35	------	------	1. 2	2. 9	60	210	700–1, 100	Low.
CeD2	Christiana silt loam, 10 to 25 percent slopes, moderately eroded.	40	100	13	35	------	------	1.2	2.9	60	210	700–1,100	Low.
Ch	Codorus silt loam	105	135	30	40	30	40	2.8	3.5	145	270	----------	
Cl	Colemantown loam	40	75	13	30	13	30	1.1	3.0	65	170	----------	
CmA	Collington fine sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1.7	3.1	85	230	1,100–1,500	High.
CmB2	Collington fine sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	230	1,100–1,500	High.
CmC2	Collington fine sandy loam, 5 to 10 percent slopes, moderately eroded.	55	105	18	35	------	------	1.6	2.9	80	230	1,100–1,500	High.
CmC3	Collington fine sandy loam, 5 to 10 percent slopes, severely eroded.	45	95	16	30	------	------	1.4	2.8	70	200	1,100–1,500	High.
CmD2	Collington fine sandy loam, 10 to 15 percent slopes, moderately eroded.	50	100	17	35	------	------	1.5	2.9	75	230	1,100–1,500	High.
CmD3	Collington fine sandy loam, 10 to 15 percent slopes, severely eroded.	------	------	------	------	------	------	1.2	2.5	60	180	----------	
CmE2	Collington fine sandy loam, 15 to 40 percent slopes, moderately eroded.	------	------	------	------	------	------	1.3	2.7	65	200	----------	
CmE3	Collington fine sandy loam, 15 to 30 percent slopes, severely eroded.	------	------	------	------	------	------	------	2.1	50	150	----------	
CnB2	Collington loamy fine sand, 0 to 5 percent slopes, moderately eroded.	40	105	14	35	14	40	1.2	3.0	60	230	1,100–1,500	Very high.
CnC2	Collington loamy fine sand, 5 to 10 percent slopes, moderately eroded.	35	95	13	30	------	------	1.1	2.8	55	230	1,100–1,500	Very high.
CnD2	Collington loamy fine sand, 10 to 15 percent slopes, moderately eroded.	35	90	12	30	------	------	1.1	2.5	55	200	1,100–1,500	Very high.
CoA	Collington silt loam, 0 to 2 percent slopes.	65	125	25	45	25	45	1.8	3.3	90	230	>1,500	Low.
CoB2	Collington silt loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	230	>1,500	Low.
CoC3	Collington silt loam, 5 to 10 percent slopes, severely eroded.	50	105	20	35	------	------	1.5	3.0	75	200	>1,500	Low.
Cr	Comus silt loam	110	140	35	45	35	45	2.8	3.5	140	270	----------	
CsB2	Croom gravelly loam, 3 to 8 percent slopes, moderately eroded.	25	60	11	30	11	30	.9	2.1	45	150	<700	Medium.
CsC2	Croom gravelly loam, 8 to 15 percent slopes, moderately eroded.	20	55	9	25	------	------	.8	1.9	40	140	<700	Medium.
CsC3	Croom gravelly loam, 8 to 15 percent slopes, severely eroded.	16	40	7	20	------	------	.6	1.7	30	125	<700	Medium.
CtB2	Croom gravelly sandy loam, 3 to 8 percent slopes, moderately eroded.	18	50	10	25	10	25	.8	2.0	40	150	<700	High.

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
CtC2	Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded.	15	45	8	22	-----	-----	0.7	1.8	35	130	<700	High.
CtC3	Croom gravelly sandy loam, 8 to 15 percent slopes, severely eroded.	11	35	6	18	-----	-----	.6	1.6	30	120	<700	High.
CtD2	Croom gravelly sandy loam, 15 to 25 percent slopes, moderately eroded.	13	40	7	18	-----	-----	.6	1.7	30	125	<700	High.
DoA	Donlonton fine sandy loam, 0 to 2 percent slopes.	55	105	20	40	20	40	1.6	3.0	80	230	1,100–1,500	Medium.
DoB2	Donlonton fine sandy loam, 2 to 5 percent slopes, moderately eroded.	55	105	20	40	20	40	1.6	3.0	80	230	1,100–1,500	Medium.
Ek	Elkton silt loam	40	75	13	30	13	30	1.1	3.0	65	170	-----	
ElB	Elkton fine sandy loam, thick surface, 0 to 5 percent slopes.	30	70	13	30	13	30	.8	2.2	60	160	-----	
EmA	Elsinboro loam, 0 to 2 percent slopes.	65	125	25	45	25	45	1.8	3.3	90	250	>1,500	Low.
EmB2	Elsinboro loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	250	>1,500	Low.
EnA	Elsinboro sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1.7	3.1	85	240	1,100–1,500	High.
EnB2	Elsinboro sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	240	1,100–1,500	High.
EnC2	Elsinboro sandy loam, 5 to 10 percent slopes, moderately eroded.	55	105	18	35	-----	-----	1.6	2.9	80	220	1,100–1,500	High.
Fl	Fallsington loam	45	95	15	35	15	35	1.5	2.9	75	200	-----	
Fs	Fallsington sandy loam	40	85	14	30	14	30	1.4	2.9	75	200	-----	
GaB	Galestown gravelly loamy sand, 0 to 8 percent slopes.	20	65	9	27	9	27	.6	1.5	35	140	700–1,100	Very high.
GaC	Galestown gravelly loamy sand, 8 to 15 percent slopes.	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	-----	
GdB	Galestown loamy sand, 0 to 8 percent slopes.	20	65	9	27	9	27	.6	1.5	35	140	700–1,100	Very high.
GdC	Galestown loamy sand, 8 to 15 percent slopes.	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	-----	
GeB	Galestown-Evesboro loamy sands, 0 to 8 percent slopes.	20	65	9	27	9	27	.6	1.5	35	140	700–1,100	Very high.
GeC	Galestown-Evesboro loamy sands, 8 to 15 percent slopes.	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	-----	
GnC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1.7	3.1	85	230	>1,500	Low.
Ha	Hatboro silt loam	75	120	20	40	20	40	2.7	3.3	135	260	-----	
HcC3	Howell clay loam, 6 to 12 percent slopes, severely eroded.	50	105	20	35	-----	-----	1.5	3.0	75	230	700–1,100	Low.
HcD3	Howell clay loam, 12 to 20 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	1.2	2.8	70	210	-----	
HoB2	Howell fine sandy loam, 2 to 6 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	240	1,100–1,500	High.
HoC2	Howell fine sandy loam, 6 to 12 percent slopes, moderately eroded.	55	105	18	35	-----	-----	1.6	2.9	80	230	1,100–1,500	High.
HwB2	Howell silt loam, 0 to 6 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	260	>1,500	Low.
HwC2	Howell silt loam, 6 to 12 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1.7	3.1	85	240	>1,500	Low.
HwD2	Howell silt loam, 12 to 20 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1.6	3.1	80	240	>1,500	Low.
HwE2	Howell silt loam, 20 to 35 percent slopes, moderately eroded.	-----	-----	-----	-----	-----	-----	1.5	2.9	75	230	-----	
Hy	Hyde silt loam	-----	90	-----	-----	-----	25	1.5	2.8	65	210	-----	
Ik	Iuka fine sandy loam	75	115	25	40	25	40	2.0	3.1	100	240	-----	

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
ImA	Iuka sandy loam, local alluvium, 0 to 2 percent slopes.	75	115	25	40	25	40	2.0	3.1	100	240	1,100–1,500	Medium.
ImB	Iuka sandy loam, local alluvium, 2 to 5 percent slopes.	75	115	25	40	25	40	2.0	3.1	100	240	1,100–1,500	Medium.
In	Iuka silt loam	105	135	35	45	35	45	2.8	3.5	145	270		
IoA	Iuka silt loam, local alluvium, 0 to 2 percent slopes.	105	135	35	45	35	45	2.8	3.5	145	270	1,100–1,500	Low.
IoB	Iuka silt loam, local alluvium, 2 to 5 percent slopes.	105	135	35	45	35	45	2.8	3.5	145	270	1, 100–1, 500	Low.
Jo	Johnston silt loam		90		25		25	1.5	2.8	65	220		
KeA	Keyport fine sandy loam, 0 to 2 percent slopes.	40	95	13	32	13	32	1.1	2.8	55	200	700–1, 100	Medium.
KeB2	Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded.	40	95	13	32	13	32	1.1	2.8	55	200	700–1, 100	Medium.
KeC2	Keyport fine sandy loam, 5 to 10 percent slopes, moderately eroded.	35	90	12	30			1.0	2.7	50	190	700–1, 100	Medium.
KpA	Keyport silt loam, 0 to 2 percent slopes.	55	100	20	35	20	35	1.8	3.2	85	210	1, 100–1, 500	Low.
KpB2	Keyport silt loam, 2 to 5 percent slopes, moderately eroded.	55	100	20	35	20	35	1.8	3.2	85	210	1, 100–1, 500	Low.
KpC2	Keyport silt loam, 5 to 15 percent slopes, moderately eroded.	50	95	18	32			1.7	3.0	80	200	1, 100–1, 500	Low.
KrC3	Keyport silty clay loam, 5 to 10 percent slopes, severely eroded.							1.5	2.8	60	180		
Ky	Klej loamy sand	35	90	13	30	13	30	1.1	2.7	55	170	700–1, 500	Medium.
LeA	Leonardtown silt loam, 0 to 2 percent slopes.	20	60		20		20	.7	1.8	45	115		
LeB	Leonardtown silt loam, 2 to 5 percent slopes.	25	65		25		25	.9	2.0	55	125		
MfB2	Magnolia fine sandy loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	250	>1, 500	High.
MgB2	Magnolia silt loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	250	>1, 500	Low.
MgC2	Magnolia silt loam, 5 to 10 percent slopes, moderately eroded.	60	115	22	40			1.7	3.1	85	250	>1, 500	Low.
MhB2	Manor loam, 3 to 8 percent slopes, moderately eroded.	55	110	21	40			1.6	2.9	80	200	1, 100–1, 500	Medium.
MhC2	Manor loam, 8 to 15 percent slopes, moderately eroded.	55	105	20	38			1.6	2.8	80	200	1, 100–1, 500	Medium.
MhD2	Manor loam, 15 to 25 percent slopes, moderately eroded.	50	100	18	36			1.5	2.7	75	185	1, 100–1, 500	Medium.
MhF2	Manor loam, 25 to 60 percent slopes, moderately eroded.									65	170		
MlA	Marr fine sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1.7	3.1	85	230	1, 100–1, 500	High.
MlB2	Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	230	1, 100–1, 500	High.
MlB3	Marr fine sandy loam, 2 to 6 percent slopes, severely eroded.	50	105	17	35			1.5	2.8	75	200	1, 100–1, 500	High.
MlC2	Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded.	55	110	18	35			1.6	2.9	80	230	1, 100–1, 500	High.
MlC3	Marr fine sandy loam, 6 to 12 percent slopes, severely eroded.	45	95	16	30			1.4	2.8	70	200	1, 100–1, 500	High.
MlD3	Marr fine sandy loam, 12 to 20 percent slopes, severely eroded.							1.2	2.5	60	200		
MlE	Marr fine sandy loam, 20 to 35 percent slopes.							1.3	2.6	65	210		
MmA	Matapeake fine sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1.7	3.1	85	230	1, 100–1, 500	High.
MmB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	230	1, 100–1, 500	High.

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
MnA	Matapeake silt loam, 0 to 2 percent slopes.	65	125	25	45	25	45	1. 8	3. 3	90	250	>1, 500	Low.
MnB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1. 8	3. 3	90	250	>1, 500	Low.
MnC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1. 7	3. 1	85	250	>1, 500	Low.
MnC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded.	50	105	20	35	-----	-----	1. 5	3. 0	75	230	>1, 500	Low.
MnD2	Matapeake silt loam, 10 to 15 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1. 6	3. 1	80	250	>1, 500	Low.
MoB2	Matapeake silt loam, silty substratum, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1. 8	3. 3	90	250	>1, 500	Low.
MrA	Matawan fine sandy loam, 0 to 2 percent slopes.	55	105	20	40	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
MrB2	Matawan fine sandy loam, 2 to 5 percent slopes, moderately eroded.	55	105	20	40	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
MrC2	Matawan fine sandy loam, 5 to 10 percent slopes, moderately eroded.	50	100	20	35	-----	-----	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
MsA	Matawan loamy sand, 0 to 2 percent slopes.	50	95	18	35	18	35	1. 5	3. 0	75	220	700–1, 100	Medium.
MsB	Matawan loamy sand, 2 to 5 percent slopes.	50	95	18	35	18	35	1. 5	3. 0	75	220	700–1, 100	Medium.
MtA	Mattapex fine sandy loam, 0 to 2 percent slopes.	55	110	20	40	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
MtB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.	55	110	20	40	20	40	1. 6	3. 0	80	230	1, 100–1, 500	Medium.
MuA	Mattapex silt loam, 0 to 2 percent slopes.	60	120	25	40	25	40	1. 7	3. 2	85	240	>1, 500	Low.
MuB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.	60	120	25	40	25	40	1. 7	3. 2	85	240	>1, 500	Low.
Mw	Mixed alluvial land	-----	-----	-----	-----	-----	-----	-----	2. 0	-----	160	----------	
MxC3	Monmouth clay loam, 5 to 10 percent slopes, severely eroded.	50	105	20	35	-----	-----	1. 5	3. 0	75	230	1, 100–1, 500	Low.
MxD3	Monmouth clay loam, 10 to 30 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	1. 2	2. 8	70	210	----------	
MyA	Monmouth fine sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1. 7	3. 1	85	230	1, 100–1, 500	High.
MyB2	Monmouth fine sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1. 7	3. 1	85	230	1, 100–1, 500	High.
MyC2	Monmouth fine sandy loam, 5 to 10 percent slopes, moderately eroded.	55	105	18	35	-----	-----	1. 6	2. 9	80	230	1, 100–1, 500	High.
MyD2	Monmouth fine sandy loam, 10 to 15 percent slopes, moderately eroded.	50	100	17	35	-----	-----	1. 5	2. 9	75	230	1, 100–1, 500	High.
MzB2	Muirkirk loamy sand, 0 to 5 percent slopes, moderately eroded.	35	95	12	30	12	30	1. 1	2. 7	55	190	700–1, 100	High.
MzC2	Muirkirk loamy sand, 5 to 10 percent slopes, moderately eroded.	30	85	11	28	-----	-----	1. 0	2. 5	50	190	700–1, 100	High.
OcA	Ochlockonee sandy loam, local alluvium, 0 to 2 percent slopes.	50	120	17	35	17	35	1. 3	3. 0	70	230	1, 100–1, 500	High.
OcB	Ochlockonee sandy loam, local alluvium, 2 to 5 percent slopes.	50	120	17	35	17	35	1. 3	3. 0	70	230	1, 100–1, 500	High.
OcC	Ochlockonee sandy loam, local alluvium, 5 to 10 percent slopes.	45	115	16	30	-----	-----	1. 3	2. 9	70	230	1, 100–1, 500	High.
OhA	Ochlockonee silt loam, local alluvium, 0 to 2 percent slopes.	85	130	25	40	25	40	2. 1	3. 3	110	250	1, 500	Low.
OhB	Ochlockonee silt loam, local alluvium, 2 to 5 percent slopes.	85	130	25	40	25	40	2. 1	3. 3	110	250	1, 500	Low.

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
Ol	Othello fine sandy loam	45	95	15	32	15	32	1.5	2.9	75	220		
Ot	Othello silt loam	50	100	18	35	18	35	1.7	3.2	85	240		
Pr	Plummer and Rutlege loamy sands.	25	70	10	22	10	22	.8	2.4	45	180		
RdA	Rumford loamy sand, 0 to 2 percent slopes.	30	85	12	30	12	30	1.9	2.5	45	190	700–1,100	Very high.
RdB2	Rumford loamy sand, 2 to 5 percent slopes, moderately eroded.	30	85	12	30	12	30	1.9	2.5	45	190	700–1,100	Very high.
RdC2	Rumford loamy sand, 5 to 10 percent slopes, moderately eroded.	27	80	11	28	-----	-----	1.8	2.4	40	190	700–1,100	Very high.
RdC3	Rumford loamy sand, 5 to 10 percent slopes, severely eroded.	25	70	10	25	-----	-----	1.7	2.2	25	160	700–1,100	Very high.
RdD2	Rumford loamy sand, 10 to 15 percent slopes, moderately eroded.	27	75	10	26	-----	-----	1.8	2.3	40	190	700–1,100	Very high.
ReB	Rumford-Evesboro loamy sands, 2 to 6 percent slopes:												
	Rumford soil	30	85	12	30	12	30	.9	2.5	45	190	700–1,100	Very high.
	Evesboro soil	20	65	9	27	9	27	.6	1.5	35	140	700–1,100	Very high.
ReC	Rumford-Evesboro loamy sands, 6 to 12 percent slopes:												
	Rumford soil	27	80	11	28	-----	-----	.8	2.4	40	190	700–1,100	Very high.
	Evesboro soil	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	700–1,100	Very high.
ReD	Rumford-Evesboro loamy sands, 12 to 20 percent slopes:												
	Rumford soil	25	75	10	26	-----	-----	.8	2.3	40	190	700–1,100	Very high.
	Evesboro soil	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	700–1,100	Very high.
SaE	Sandy land, steep	-----	-----	-----	-----	-----	-----	-----	-----	-----	100	-----	
ScB	Sandy and clayey land, gently sloping.	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	-----	
ScC	Sandy and clayey land, sloping	(2)	(2)	(2)	(2)	-----	-----	(2)	(2)	(2)	(2)	-----	
ScD	Sandy and clayey land, moderately steep.	-----	-----	-----	-----	-----	-----	(2)	(2)	(2)	(2)	-----	
SfB2	Sassafras gravelly loam, 2 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	250	1,100–1,500	Medium.
SfC2	Sassafras gravelly loam, 5 to 10 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1.7	3.1	85	250	1,100–1,500	Medium.
SfD2	Sassafras gravelly loam, 10 to 15 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1.6	3.1	80	250	1,000–1,500	Medium.
SgB2	Sassafras gravelly sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	230	1,100–1,500	High.
SgC2	Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded.	55	110	18	35	-----	-----	1.6	2.9	80	230	1,100–1,500	High.
SgC3	Sassafras gravelly sandy loam, 5 to 10 percent slopes, severely eroded.	45	95	16	30	-----	-----	1.4	2.8	70	200	1,100–1,500	High.
SgD2	Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded.	50	100	17	35	-----	-----	1.5	2.9	75	230	1,100–1,500	High.
SgD3	Sassafras gravelly sandy loam, 10 to 15 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	1.2	2.5	60	200	-----	
SgE	Sassafras gravelly sandy loam, 15 to 30 percent slopes.	-----	-----	-----	-----	-----	-----	1.3	2.6	65	210	-----	
ShA	Sassafras sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1.7	3.1	85	230	1,100–1,500	High.
ShB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1.7	3.1	85	230	1,100–1,500	High.
ShC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.	55	110	18	35	-----	-----	1.6	2.9	80	230	1,100–1,500	High.

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
ShC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.	45	95	16	30	-----	-----	1. 4	2. 8	70	200	1, 100–1, 500	High.
SlD	Sassafras-Collington-Aura gravelly sandy loams, 12 to 20 percent slopes:												
	Sassafras soil	50	100	17	35	-----	-----	1. 5	2. 9	75	230	1, 100–1, 500	High.
	Collington soil	50	100	17	35	-----	-----	1. 5	2. 9	75	230	1, 100–1, 500	High.
	Aura soil	30	75	10	25	-----	-----	. 8	2. 2	40	115	1, 100–1, 500	High.
SlE	Sassafras-Collington-Aura gravelly sandy loams, 20 to 35 percent slopes:												
	Sassafras soil	-----	-----	-----	-----	-----	-----	1. 3	2. 6	65	210	-----	
	Collington soil	-----	-----	-----	-----	-----	-----	1. 3	2. 7	65	200	-----	
	Aura soil	-----	-----	-----	-----	-----	-----	-----	1. 8	30	85	-----	
SmA	Shrewsbury fine sandy loam, 0 to 2 percent slopes.	40	85	14	30	14	30	1. 4	2. 9	75	200	-----	
SmB	Shrewsbury fine sandy loam, 2 to 5 percent slopes.	45	95	15	32	15	32	1. 6	3. 1	85	220	-----	
SnA	Shewsbury silt loam, 0 to 2 percent slopes.	45	95	15	35	15	35	1. 5	2. 9	75	200	-----	
SpB	Silty and clayey land, gently sloping.	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	-----	
SpC	Silty and clayey land, sloping	(2)	(2)	(2)	(2)	-----	-----	(2)	(2)	(2)	(2)	-----	
SpE	Silty and clayey land, steep	-----	-----	-----	-----	-----	-----	(2)	(2)	(2)	(2)	-----	
StB2	Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded.	60	115	20	40	20	40	1. 7	3. 1	85	230	1, 100–1, 500	High.
StC2	Sunnyside fine sandy loam, 5 to 10 percent slopes, moderately eroded.	55	110	18	35	-----	-----	1. 6	2. 9	80	230	1, 100–1, 500	High.
StD2	Sunnyside fine sandy loam, 10 to 15 percent slopes, moderately eroded.	50	100	17	35	-----	-----	1. 5	2. 9	75	230	1, 100–1, 500	High.
StE	Sunnyside fine sandy loam, 15 to 30 percent slopes.	-----	-----	-----	-----	-----	-----	1. 3	2. 6	65	210	-----	
SuB2	Sunnyside loam, 0 to 5 percent slopes, moderately eroded.	65	125	25	45	25	45	1. 8	3. 3	90	250	1, 100–1, 500	Medium.
SuC2	Sunnyside loam, 5 to 10 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1. 7	3. 1	85	250	1, 100–1, 500	Medium.
SuD2	Sunnyside loam, 10 to 15 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1. 6	3. 1	80	250	1, 100–1, 500	Medium.
SvC3	Sunnyside sandy clay loam, 5 to 10 percent slopes, severely eroded.	45	95	16	30	-----	-----	1. 4	2. 8	70	200	700–1, 100	Low.
SvD3	Sunnyside sandy clay loam, 10 to 15 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	1. 2	2. 5	60	200	-----	
WaA	Westphalia fine sandy loam, 0 to 2 percent slopes.	60	115	20	40	20	40	1. 7	3. 1	85	230	1, 100–1, 500	Very high.
WaB2	Westphalia fine sandy loam, 2 to 6 percent slopes, moderately eroded.	60	115	20	40	20	40	1. 7	3. 1	85	230	1, 100–1, 500	Very high.
WaB3	Westphalia fine sandy loam, 2 to 6 percent slopes, severely eroded.	50	105	17	35	-----	-----	1. 5	2. 8	75	200	1, 100–1, 500	Very high.
WaC2	Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded.	55	110	18	35	-----	-----	1. 6	2. 9	80	230	1, 100–1, 500	Very high.
WaC3	Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded.	45	95	16	30	-----	-----	1. 4	2. 8	70	200	1, 100–1, 500	Very high.
WaD2	Westphalia fine sandy loam, 12 to 20 percent slopes, moderately eroded.	50	100	17	35	-----	-----	1. 5	2. 9	75	230	1, 100–1, 500	Very high.
WaD3	Westphalia fine sandy loam, 12 to 20 percent slopes, severely eroded.	-----	-----	-----	-----	-----	-----	1. 2	2. 5	60	200	-----	

See footnotes at end of table.

TABLE 10.—*Estimated average acre yields of principal crops*—Continued

Map symbol	Soil	Corn		Wheat		Soybeans		Clover hay		Tall-grass pasture		Yields of tobacco	Quality of tobacco
		A	B	A	B	A	B	A	B	A	B		
		Bushel	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Bushel*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	*Pounds*	
WbB2	Westphalia very fine sandy loam, 0 to 6 percent slopes, moderately eroded.	65	125	25	45	25	45	1.8	3.3	90	250	1,100–1,500	Medium.
WbC2	Westphalia very fine sandy loam, 6 to 12 percent slopes, moderately eroded.	60	115	22	40	-----	-----	1.7	3.1	85	250	1,100–1,500	Medium.
WbD2	Westphalia very fine sandy loam, 12 to 20 percent slopes, moderately eroded.	55	110	21	40	-----	-----	1.6	3.1	80	250	1,100–1,500	Medium.
WeB2	Westphalia-Evesboro complex, 2 to 6 percent slopes, moderately eroded:												
	Westphalia soil	40	90	15	35	15	35	1.1	2.5	60	190	700–1,100	High.
	Evesboro soil	20	65	9	27	9	27	.6	1.5	35	140	700–1,100	High.
WeC2	Westphalia-Evesboro complex, 6 to 12 percent slopes, moderately eroded:												
	Westphalia soil	35	80	13	30	-----	-----	1.0	2.4	55	190	700–1,100	High.
	Evesboro soil	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	700–1,100	High.
WeC3	Westphalia-Evesboro complex, 6 to 12 percent slopes, severely eroded:												
	Westphalia soil	30	75	12	30	-----	-----	.9	2.2	50	160	700–1,100	High.
	Evesboro soil	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	700–1,100	High.
WeD3	Westphalia-Evesboro complex, 12 to 20 percent slopes, severely eroded:												
	Westphalia soil	-----	-----	-----	-----	-----	-----	.7	2.0	45	160	-----	
	Evesboro soil	-----	-----	-----	-----	-----	-----	-----	-----	-----	120	-----	
WoA	Woodstown sandy loam, 0 to 2 percent slopes.	55	105	20	40	20	40	1.6	3.0	80	230	1,100–1,500	Medium.
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	55	105	20	40	20	40	1.6	3.0	80	230	1,100–1,500	Medium.
WoC2	Woodstown sandy loam, 5 to 10 percent slopes, moderately eroded.	50	100	20	35	-----	-----	1.6	3.0	80	230	1,100–1,500	Medium.

[1] The number of days in a year that 1 acre will graze a cow, a horse, or a steer without injury to the pasture.
[2] Yields are variable and cannot be accurately estimated.

sweetgum, blackgum, holly, swamp maple, hickory, dogwood, beech, birch, and many kinds of scrub oak. Many areas that were formerly wooded have been cultivated at one time. Almost all areas that remain wooded have been cut over and are in second and third growth.

Virginia pine has invaded the cutover and abandoned woodland, particularly on the sandier, better drained soils. Locally, stands consist of shortleaf pine, or pitch pine and pond pine, or of loblolly pine, but the stands are neither extensive nor pure in many places.

Loblolly pine is more valuable for timber and pulpwood than Virginia pine. It is used for reestablishing cover in many places because it grows well on many kinds of soils, it reseeds naturally where conditions are favorable, and it can be established in pure stands by planting seedlings. In some places, however, Virginia pine reseeds more readily than loblolly pine and also can be readily established by planting. If white pine is planted and is not overtopped, it grows better than Virginia pine.

Woodland suitability groups

In this subsection, the soils in the county are grouped in woodland suitability groups according to their suitability for trees. Each woodland group is made up of soils that are suitable for about the same kinds of trees, that require similar management, and that have about the same potential productivity. The numbers assigned to groups in this report are not consecutive, because the groups in this county are only part of the system used in Maryland and Delaware.

The potential productivity of a soil for trees can be expressed as a site index. The site index for a given soil is the height, in feet, that a specified kind of tree growing on that soil will reach in 50 years. In Maryland the site indexes for many kinds of soils have been determined for loblolly pine because it is the most important tree in many parts of the State. For other kinds of trees, fewer determinations have been made on fewer kinds of soils.

To obtain the site indexes used in this survey, the results of studies in Maryland and Delaware were correlated with the results of similar studies in Virginia, New Jersey, West Virginia and Pennsylvania. In stands where a site index was not determined by actual measurement, it was assumed to be approximately the same as the site index of similar soils.

All the soils in each woodland suitability group have approximately the same site index and are suitable for about the same kind of trees. Also about the same for each group are limitations and hazards that affect management. These are competition from other plants, limitations to the use of equipment, seedling mortality, windthrow, and erosion. The limitations and hazards are rated *slight*, *moderate*, or *severe* in the descriptions of the woodland suitability groups.

Plant competition refers to competition from undesirable species that invade when openings are made in the canopy. The ratings given for the woodland groups on the Coastal Plain (group 1 through 18) relate to plants competing with loblolly pine, but the ratings given for groups on the Piedmont (groups 22 through 45) relate to plants competing with hardwoods and pines. The ratings for equipment limitations are based on the degree that soils and topographic features restrict or prohibit the use of equipment commonly employed in tending a crop of trees or in harvesting the trees. Seedling mortality refers to the expected degree of mortality of naturally occurring or planted trees as influenced by the kind of soil. The ratings for hazard of windthrow are determined on the basis of properties of the soils that influence the development of tree roots. The ratings for hazard of erosion are determined on the basis of the erodibility of the soil where it is not fully protected by a woodland cover, as in the seedling stage of tree growth or after clear harvesting.

In the descriptions of woodland suitability groups that follow, the names of the soil series represented in each group are mentioned, but this does not mean that all the soils in the given series appear in the groups. To find the names of the soils in any given woodland suitability group, refer to the "Guide to Mapping Units" at the back of this survey. Areas that were mapped as complexes containing urban land were not assigned to a woodland group, because the rate of community development indicates that these areas will never be used as woodland. The miscellaneous land types in the county were not assigned woodland groups, because, without intensive reclamation, they are not suited as woodland.

Assistance in management of woodland can be obtained free from the assistant district forester for the county. He can be reached directly or through the county agent or personnel of the Prince Georges Soil Conservation District.

WOODLAND SUITABILITY GROUP 1

This woodland group consists of poorly drained and very poorly drained soils in the Colemantown, Elkton, Fallsington, Hyde, and Shrewsbury series. These soils are of the uplands; they have a surface layer of loam, silt loam, sandy loam, or fine sandy loam. Their subsoil ranges from friable sandy clay loam to plastic clay. Some of the soils occur in upland depressions and may be ponded in wet periods unless surface drainage is improved.

In order of their priority for timber, trees suitable for planting are loblolly pine, oak, sweetgum, and yellow-poplar. Scotch pine, white pine, and Austrian pine are suitable for Christmas trees. Existing stands of sweetgum and other commercial hardwoods should be managed until they are ready for harvesting. After harvesting, loblolly pine can be planted. In areas where surface drainage is adequate, encouraging yellow-poplar is a good practice.

On the soils of this group, the site index is 85 or more for loblolly pine and 75 to 90 for white pine. On soils having a site index of 85, the expected yield per acre from well-stocked, unmanaged stands of 50-year-old loblolly pine is about 14,000 board feet of merchantable timber or about 65 cords of pulpwood. For the next 10 to 20 years, the expected yearly increase is about 500 board feet of timber or about one-half cord of pulpwood.

Seedling mortality is slight on these soils, but plant competition is severe for conifers and moderate for hardwoods. Wetness severely limits the use of equipment. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 2

This woodland group consists of poorly drained and very poorly drained Bibb and Johnston soils and Mixed alluvial land. These soils occur on flood plains in recent deposits of sediments washed from the Coastal Plain uplands. In most places they have a sandy loam or silt loam surface layer. Flooding may occur once or more a year, but floodwaters seldom stand for long periods and do not stagnate. These soils are also subject to scouring or deposition.

In order of their priority for timber, trees suitable for planting are oak, sweetgum, yellow-poplar, and loblolly pine. Scotch pine and white pine are suitable for Christmas trees. Sweetgum and oak should be encouraged in natural stands, and yellow-poplar on hummocks, on natural levees along streams, and in other well-drained areas.

On the soils of this group the site index is 85 or more for loblolly pine, 75 to 100 for yellow-poplar, and 75 to 95 for sweetgum. For loblolly pine the expected yield of timber or pulpwood per acre is about the same as that on the soils in woodland group 1. The yield of hardwoods is generally somewhat higher than that for the soils of group 1.

Because of flooding, seedling mortality is moderate on the soils of this group. Competition is severe for conifers and moderate for hardwoods. Wetness and flooding severely limit the use of equipment. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 3

This woodland group consists of moderately well drained or somewhat poorly drained soils in the Adelphia, Klej, Matawan, and Woodstown series. These soils have a loose to firm sandy clay subsoil that ranges from slow to rapid in permeability.

In order of their priority for timber, trees suitable for planting are loblolly pine, oak, sweetgum, and yellow-poplar. Scotch pine, Norway spruce, Austrian pine, and white pine are suitable for Christmas trees. Existing stands of yellow-poplar, sweetgum, and oak should be managed until they are ready for harvesting. After harvesting, loblolly pine can be planted.

On the soils of this group, the site index is 85 or more for loblolly pine, 80 to 90 for yellow-poplar, and 75 to 95 for sweetgum. The yield of loblolly pine should be about the same as that for the soils in woodland group 1, and the yield of hardwoods should be fairly good.

Seedling mortality is slight on these soils. Plant competition is severe for conifers and moderate for hardwoods. Wetness moderately limits the use of heavy logging and other equipment. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 4

This woodland group consists of moderately well drained and well drained soils of the Iuka and Ochlockonee series. These soils are on flood plains and on local accumulations of alluvium that recently washed from Coastal Plain uplands. The soils on flood plains are generally flooded once or more each year, but flooding generally is not so frequent nor so severe as it is on the soils of woodland group 2. Flooded soils are subject to scouring and to deposition. The soils in this group that are on local alluvium ordinarily are not flooded, but they receive a considerable amount of surface wash, or runoff, from adjacent uplands.

In order of their priority for timber, trees suitable for planting are yellow-poplar, oak, sweetgum, and loblolly pine. Scotch pine, Norway spruce, Austrian pine, and white pine are suitable for Christmas trees.

On the soils of this group, the site index is 85 or more for loblolly pine. For loblolly pine the expected yield of timber or pulpwood is about the same as that on the soils in woodland group 1. Accurate estimates of yields for hardwoods are not available, but yields probably are higher than the average for most soils in the county.

Seedling mortality is slight on these soils. Plant competition is severe for conifers and moderate for hardwoods. Wetness and flooding moderately limit the use of equipment on the Iuka soils in this group but the Ochlockonee soils in Prince Georges County are not subject to flooding and are wet only temporarily. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 5

This woodland group consists of deep, nearly level to strongly sloping, somewhat excessively drained to excessively drained soils of the Galestown and Evesboro series. These soils are very sandy and contain gravel in places. They tend to be loose and are rapidly permeable throughout.

In order of their priority for timber, trees suitable for planting are loblolly pine, shortleaf pine, and Virginia pine. Scotch pine, white pine, and Virginia pine are suitable for Christmas trees. Existing stands of shortleaf pine or of Virginia pine should be managed until they are ready for harvesting. After harvesting, loblolly pine can be planted.

On the soils of this group, the site index is 75 to 84 for loblolly pine. On soils having a site index of 80, the expected yield per acre from well-stocked, unmanaged stands of 50-year-old loblolly pine is about 11,500 board feet of merchantable timber or about 60 cords of pulpwood. For the next 10 to 20 years, the expected annual increase is about 400 board feet of timber or about one-half cord of pulpwood.

Seedling mortality is moderate because the soils in this group are droughty. Both conifers and hardwoods receive slight competition from other plants. Because these sandy soils are loose, limitations to the use of equipment are moderate. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 6

This woodland group consists of only Sandy land, steep. Except for steeper slopes this land type is like the soils in woodland group 5.

In order of their priority for timber, trees suitable for planting are loblolly pine, shortleaf pine, and Virginia pine. Scotch pine, white pine, and Virginia pine are suitable for Christmas trees. Existing stands of shortleaf pine and of Virginia pine should be managed until the trees are ready for harvesting. After harvesting, loblolly pine can be planted.

On the land in this group, the site index is 75 to 84 for loblolly pine. Yield is approximately the same as that for the soils of woodland group 5.

Seedling mortality is moderate because this land is droughty. Plant competition is moderate for conifers and slight for hardwoods. Steep slopes and looseness of the soil material severely limit the use of heavy equipment. Erosion is a moderate hazard and is more likely to be caused by wind than by water. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 7

This woodland group consists of deep, well-drained, nearly level and gently sloping soils in the Chillum, Christiana, Collington, Elsinboro, Evesboro, Howell, Magnolia, Marr, Matapeake, Monmouth, Muirkirk, Rumford, Sassafras, Sunnyside, and Westphalia series. The subsoil of these soils ranges from friable sandy loam to firm clay. The nearly level soils are only slightly eroded, but the gently sloping soils are moderately eroded. This is the most extensive and widespread woodland group in Prince Georges County.

In order of their priority for timber, trees suitable for planting are yellow-poplar, oak, loblolly pine, and Virginia pine. Scotch pine, Norway spruce, Austrian pine, and white pine are suitable for Christmas trees. Existing stands of yellow-poplar and oak should be especially well managed until they are ready for harvesting. After harvesting, loblolly pine can be planted. Virginia pine grows well, especially on the sandier soils of the group. The soils in this group are probably easier to manage for woodland production than are any other soils in the county.

On the soils of this group the site index is 75 to 84 for loblolly pine and 80 to 100 for yellow-poplar. Yields from well-stocked unmanaged stands of loblolly pine are approximately the same as the yields on soils in woodland group 5, but well-managed stands of loblolly pine should produce slightly more. On nearly all the soils in woodland group 7, yellow-poplar produces more merchantable timber than loblolly pine.

Seedling mortality is slight on these soils. Plant competition is moderate for conifers and slight for hardwoods. The use of equipment is slightly limited. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 8

This woodland group consists of sloping to moderately steep, loamy soils in the Aura, Chillum, Christiana, Collington, Elsinboro, Evesboro, Howell, Magnolia, Marr, Matapeake, Monmouth, Muirkirk, Rumford, Sassafras, Sunnyside, and Westphalia series. Except that they are more sloping, the soils in this woodland group are like those in woodland group 7. Woodland group 8 is the second most extensive group in the county.

In order of their priority for timber, trees suitable for planting are yellow-poplar, oak, loblolly pine, and Virginia pine. Scotch pine, Norway spruce, Austrian pine, and white pine are suitable for Christmas trees.

On the soils of this group, the site index is 75 to 84 for loblolly pine and 80 to 100 for yellow-poplar. Yields are about the same as those for the soils in woodland suitability group 5.

Seedling mortality is slight on these soils. Plant competition is moderate for conifers and slight for hardwoods. The use of equipment is slightly limited. The erosion hazard is moderate, particularly in areas that have been heavily cut over and in areas that have been prepared for planting. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 9

This woodland group consists of moderately well drained, sloping soils and well drained, steep soils. These soils are in the Adelphia, Aura, Collington, Howell, Keyport, Marr, Sassafras, Sunnyside, and Woodstown series. In most areas these soils are moderately eroded.

In order of their priority for timber, trees suitable for planting are yellow-poplar, oak, loblolly pine, and Virginia pine. Scotch pine, Norway spruce, and Austrian pine are suitable for Christmas trees.

On the soils of this group, the site index is 75 to 84 for loblolly pine and 80 to 100 for yellow-poplar. Yields are about the same as those for the soils in woodland group 5.

Seedling mortality is slight. Plant competition is moderate for conifers and slight for hardwoods. Limitations to the use of equipment are moderate on slopes of 15 to 20 percent and are severe on slopes of more than 20 percent. On the Adelphia, Keyport, and Woodstown soils, wetness is a moderate limitation to the use of equipment. Erosion is a moderate hazard on the Adelphia and Woodstown soils and a severe hazard on all other soils in this group. Windthrow is a moderate hazard on all soils in this group except the Keyport and is a severe hazard on the Keyport soils.

WOODLAND SUITABILITY GROUP 10

This woodland group consists of poorly drained and very poorly drained soils of the Othello, Plummer, and Rutlege series. These soils range from very sandy to very silty throughout. In places they occupy depressions and are ponded during wet periods.

In order of their priority for timber, trees suitable for planting are loblolly pine (fig. 14), oak, and sweetgum. Scotch pine, white pine, and Austrian pine are suitable for Christmas trees. In adequately drained areas, encouraging yellow-poplar is a good practice.

On soils of this group, the site index for loblolly pine is 75 to 84. Yields of loblolly pine are about the same as those on the soils in woodland group 5.

Figure 14.—**An excellent natural stand of loblolly pine in a poorly drained area of Othello silt loam that was drained and used as cropland but that reverted to loblolly pine after cropping was discontinued. Woodland group 10.**

Seedling mortality is slight. Plant competition is moderate for conifers and severe for hardwoods. Wetness severely limits the use of equipment. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 11

This woodland group consists of nearly level to gently sloping, moderately well drained or poorly drained soils in the Butlertown, Donlonton, Keyport, Leonardtown, and Mattapex series. The moderately well drained soils have a heavy clay, platy silt loam, or silty clay loam subsoil, and the poorly drained soils have a dense, tough fragipan in their subsoil. All these soils are seasonally wet, and the more poorly drained soils remain wet for long periods.

In order of their priority for timber, trees generally suitable for planting are yellow-poplar, oak, sweetgum, loblolly pine, and Virginia pine. An exception is yellow-poplar, which is not suited to the Leonardtown soils. If loblolly pine is planted, competing trees, shrubs, and vines should be controlled until the seedlings are well established. Scotch pine, Norway spruce, and Austrian pine are suitable for Christmas trees.

On soils of this group, the site index is 75 to 84 for loblolly pine; 80 to 100 for yellow-poplar; and 75 to 95

for sweetgum. Yields from well-stocked, unmanaged stands of loblolly pine are about the same as those on the soils in woodland group 5.

Seedling mortality is slight. Plant competition is severe for conifers and moderate for hardwoods. Wetness moderately limits the use of equipment. The erosion hazard is slight, and the windthrow hazard is moderate.

WOODLAND SUITABILITY GROUP 12

This woodland group consists of nearly level to gently sloping, moderately well drained and well drained, loamy soils in the Aura, Beltsville, and Croom series. The Croom soils are gravelly. In this group the moderately well drained soils have a dense fragipan, and the well drained soils have a hard, cemented subsoil or substratum.

In order of their priority for timber, trees suitable for planting are loblolly pine and Virginia pine. In general, hardwoods do not grow well.

On the soils of this group, the site index is 65 to 74 for loblolly pine. On soils having a site index of 70, the expected yield per acre from a well-stocked, unmanaged stand of 50-year-old loblolly pine is about 6,500 board feet of merchantable timber or about 50 cords of pulpwood. For the next 10 years or more, the expected yearly increase is about 300 board feet of timber or about four-tenths cord of pulpwood. The rate of increase generally declines after trees reach 60 to 65 years of age.

Seedling mortality is slight on these soils, but plant competition is moderate for conifers and slight for hardwoods. Wetness limits the use of equipment moderately on the Beltsville soils and slightly on the Aura and Croom soils. Because runoff tends to be excessive, erosion is a moderate hazard. Windthrow is a moderate hazard because the root zone is shallow.

WOODLAND SUITABILITY GROUP 13

This woodland group consists of well-drained, gently sloping to steep, severely eroded soils in the Collington, Evesboro, Marr, Matapeake, Monmouth, Rumford, Sassafras, Sunnyside, and Westphalia series. These soils are extensive in this county. They have a friable sandy loam to firm sandy clay subsoil.

In order of their priority for timber, trees suitable for planting are loblolly pine and Virginia pine. If hardwoods are desired, they should be established by direct seeding. Scotch pine, Norway spruce, Austrian pine, and white pine are suitable for Christmas trees.

On the soils of this group, the site index is 65 to 74 for loblolly pine. Yields from well-stocked, unmanaged stands of loblolly pine are approximately the same as the yields on the soils in woodland group 12.

Seedling mortality is moderate because the soils in this group are droughty and because they make a poor seedbed. Plant competition is slight for conifers and hardwoods. The use of equipment is moderate on slopes of 15 to 20 percent and is severe on slopes of more than 20 percent. Erosion is a severe hazard. The windthrow hazard is moderate because the root zone of these severely eroded soils is shallow.

WOODLAND SUITABILITY GROUP 14

This woodland group consists of several mapping units of miscellaneous land types. These well-drained to somewhat excessively drained, gently sloping to moderately steep land types are made up of sandy or silty material over clay. The surface layer ranges from a few inches to several feet in thickness. The clay is near the surface in some places and is at a considerable depth in other places.

In order of their priority for timber, trees suitable for planting are Virginia pine and loblolly pine. On these soils Virginia pines are more numerous and probably better suited than loblolly pines. Hardwoods are of minor importance. Scotch pine, Norway spruce, and Austrian pine are suitable for Christmas trees.

On the land types in this group, the site index is 65 to 74 for loblolly pine. Yields of loblolly pine are variable, but on the average they are about the same as yields on the soils of woodland group 12.

Seedling mortality is slight on these land types, but plant competition is moderate for conifers and slight for hardwoods. Normally, there is only a slight limitation to the use of equipment, but great care should be taken, particularly when the soil material is wet, if heavy machinery is operated close to steep slopes or near cuts. This care is required because the clay subsoil and the underlying material are extremely unstable. Cuts and banks tend to flow, slip, or slide and have been known to collapse. Erosion is a slight to moderate hazard, and windthrow is a moderate hazard.

WOODLAND SUITABILITY GROUP 16

This woodland group consists of moderately well drained, loamy soils that have a tough fragipan; well drained, loamy soils that have a hard, cemented, or clayey subsoil; and Silty and clayey land, steep. The soils are in the Aura, Beltsville, and Croom series. They are moderately steep to steep, and most areas are moderately eroded.

In order of their priority for timber, trees suitable for planting are Virginia pine and loblolly pine. Except for a few oaks that can withstand drought, hardwoods are not suitable. Scotch pine, Norway spruce, and Virginia pine are suitable for Christmas trees.

Yields from all trees are low on soils and land types of this group. The site index for loblolly pine is less than 65. The expected yield per acre from a well-stocked stand of 50-year-old loblolly pine is about 1,500 to 2,000 board feet of merchantable timber or about 40 cords of pulpwood. Although yields are generally low, some areas of this group should be used as woodland to protect watersheds, to promote wildlife, and to provide places of beauty.

Seedling mortality is slight. Plant competition is moderate for conifers and slight for hardwoods. The use of equipment is moderate on slopes of 15 to 20 percent and is severe on slopes of more than 20 percent. Seasonal wetness on the Beltsville soils also limits the use of equipment. Erosion is a severe hazard. The windthrow hazard is moderate on slopes of 15 to 20 percent and is severe on steeper slopes.

WOODLAND SUITABILITY GROUP 17

Except that they are severely eroded, the soils in this woodland group are somewhat similar to the soils in group 16. Woodland group 17 consists of loamy soils in the Aura, Beltsville, Chillum, Christiana, Croom, Howell, and Keyport series.

For timber Virginia pine is the only tree suitable for planting on these severely eroded, unproductive soils, and it has low yields. The site index is less than 65 for loblolly pine, and yields of this tree are even lower than they are on the soils of woodland group 16. Suitable for Christmas trees, however, are Virginia pine and Scotch pine. Using these soils as woodland should be considered because they are not suited as cropland or pasture.

Seedling mortality is severe because a seedbed on these soils is poor. Plant competition is slight for both conifers and hardwoods. The use of equipment is moderately limited by steepness and, in places, by wetness. Erosion and windthrow are moderate hazards.

WOODLAND SUITABILITY GROUP 18

This woodland group consists of only Christiana clay, 15 to 35 percent slopes, severely eroded. This soil is steeper than the Christiana clays in woodland group 17, and use as woodland is more severely limited. Virginia pine is the only tree suitable for planting either for timber or for Christmas trees.

On this soil the site index for loblolly pine is less than 65. The expected yields are lower than those on the soils in woodland group 16.

Seedling mortality is severe because this soil makes a poor seedbed. Plant competition is slight for both conifers and hardwoods. Erosion and windthrow are severe hazards. The use of heavy equipment is more severely limited on this soil than on the soils in woodland group 17 because slopes are steeper and soil stability is poor, particularly when this soil is wet.

WOODLAND SUITABILITY GROUP 22

Hatboro silt loam is the only soil in this woodland group. Like the soils in woodland group 2, this soil is on flood plains, but it is poorly drained instead of very poorly drained. Also, its sediment washed from upland areas of weathered crystalline rock in the Piedmont instead of from Coastal Plain uplands. For these reasons, this soil is more productive of timber than the soils in woodland group 2.

In order of their suitability for timber, trees suitable for planting are oak, sweetgum, white pine, and yellow-poplar. White pine is suitable for Christmas trees.

On the soil of this group the site index is 75 to 100 for yellow-poplar, 95 or more for oak, 75 to 95 for sweetgum, and 75 to 84 for white pine. Water-tolerant hardwoods grow well, and yellow-poplar grows especially well in areas that are adequately drained. The site index for oak is 95 or more, but an estimate of the expected yield was not made.

Seedling mortality is moderate because of flooding. Plant competition is severe for conifers and moderate for hardwoods. Wetness and flooding severely limit the use of equipment. Floods are likely once or twice a year, and they scour this soil or deposit additional material. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 29

This woodland group consists of moderately well drained and well drained, loamy soils of the Codorus and Comus series. These soils are similar to the soils in woodland group 4, but their sediments washed from areas of weathered crystalline rock on the Piedmont instead of from Coastal Plain uplands.

In order of their priority for timber, trees suitable for planting are white pine, oak, sweetgum, and yellow-poplar. Douglas fir, Scotch pine, and white pine are suitable for Christmas trees. Where existing stands are managed, hardwoods should be given preference.

On soils of this group, the site index is 80 to 90 for yellow-poplar, 75 to 84 for oak, 75 to 95 for sweetgum, and 85 to 94 for white pine.

Seedling mortality is slight, but plant competition is severe for conifers and moderate for hardwoods. Wetness and flooding moderately limit the use of equipment. During floods, which may occur once or twice a year, these soils are somewhat scoured or additional material is deposited. Windthrow is a slight hazard.

WOODLAND SUITABILITY GROUP 30

This woodland group consists of only Glenelg loam, 8 to 15 percent slopes, moderately eroded. This deep, well-drained soil occurs on the Piedmont.

In order of their priority for timber, trees suitable for planting are oak, yellow-poplar, white pine, shortleaf pine, and Virginia pine. Scotch pine, Norway spruce, Austrian pine, white pine, and blue spruce are suitable for Christmas trees. Existing stands of hardwoods should be managed so that oak or yellow-poplar are encouraged. Hardwoods should be planted by direct seeding, and pines by transplanting seedlings.

On this soil the site index is 80 to 90 for yellow-poplar, 75 to 84 for oak, and 75 to 84 for white pine. The estimated site index for shortleaf and Virginia pine is about 70. Estimates of expected yields of trees were not made for this woodland group.

Seedling mortality is slight, but plant competition is severe for conifers and moderate for hardwoods. The use of equipment is slightly limited. Erosion and windthrow are slight hazards.

WOODLAND SUITABILITY GROUP 43

This woodland group consists of gently sloping to moderately sloping, very deep, loamy soils of the Manor series. These well-drained to somewhat excessively drained soils occur on the Piedmont in moderately eroded areas. They are highly micaceous.

In order of their priority for timber, trees suitable for planting are white pine, shortleaf pine, Virginia pine, yellow-poplar, and oak. Scotch pine, Norway spruce, Austrian pine, white pine, and blue spruce are suitable for Christmas trees. Existing stands should be managed so that any valuable species is encouraged, but yellow-poplar should be given priority. For planting, pines are more suitable than yellow-poplar.

On soils of this group, the site index is 80 to 90 for yellow-poplar, 65 to 74 for oak, and 75 to 84 for white pine. The estimated site index for shortleaf and Virginia pine is about 70. Expected yields of trees on this woodland group were not estimated.

Seedling mortality is slight, but plant competition is severe for conifers and moderate for hardwoods. The use of equipment is slightly limited. The erosion hazard is moderate, and the windthrow hazard is slight.

WOODLAND SUITABILITY GROUP 44

This woodland group consists of only Manor loam, 15 to 25 percent slopes, moderately eroded. Except for steeper slopes, this soil is similar to the soils in woodland group 43.

In order of their priority for timber, trees suitable for planting are yellow-poplar, white pine, shortleaf pine, Virginia pine, and oak. Scotch pine, Norway spruce, Austrian pine, white pine, and blue spruce are suitable for Christmas trees.

On this soil the site index is 80 to 90 for yellow-poplar, 65 to 74 for oak, and 75 to 84 for white pine. The estimated site index for shortleaf and Virginia pines is about 70. Expected yields of trees on this woodland group were not estimated.

Seedling mortality is slight, but plant competition is severe for conifers and moderate for hardwoods. Steep slopes moderately limit the use of equipment. The erosion hazard is severe, and the windthrow hazard is slight.

WOODLAND SUITABILITY GROUP 45

This woodland group consists of only Manor loam, 25 to 60 percent slopes, moderately eroded. This soil is on the Piedmont and is very steep, well drained and somewhat excessively drained, and highly micaceous. Except for steeper slopes, it is similar to the soil in woodland group 44.

In order of their priority for timber, trees suitable for planting are yellow-poplar, white pine, shortleaf pine, Virginia pine, and oak. Scotch pine, Norway spruce, Austrian pine, white pine, and blue spruce are suitable for Christmas trees.

On this soil the site index is 80 to 90 for yellow-poplar, 65 to 74 for oak, and 75 to 84 for white pine. Estimates of yields were not made.

Seedling mortality is slight, but plant competition is severe for conifers and moderate for hardwoods. Steepness of slopes severely limits the use of equipment. The erosion hazard is severe, and the windthrow hazard is slight.

Yields of loblolly pine

Table 11 lists data on growth and yield of second-growth loblolly pine in a fully stocked, unmanaged stand. Yield tables for oak, sweetgum, Virginia pine, yellow pine, and other trees are available at the office of the assistant district forester for the county.

As shown in table 11, a stand of unmanaged, fully stocked, second-growth loblolly pine that has an average age of 40 years, and a site index of 70, will yield about 42 cords of wood, or about 3,500 board feet of lumber per acre. If the stand is 80 years old, and is on a soil having the same site index of 70, the yield is about 62 cords of wood or 15,000 board feet of lumber per acre. Interpolations can be made for site indexes and for ages of trees between the site indexes and ages listed in table 11.

Also, the average annual increase in cordwood and lumber for any site index can be determined by using the data in table 11. For example, loblolly pine on a soil having a site index of 80 yields about 6,000 board feet at 40 years of age. At 60 years of age, the yield would be about 16,000 feet. Thus, the increase in 20 years would be 10,000 board feet, or an average annual increase of about 500 board feet per acre.

TABLE 11.—*Growth and yield data for a fully stocked, unmanaged stand of second-growth loblolly pine*

Site index [1]	Age [2]	Total volume per acre		Average diameter [3]
			Board feet (Doyle)	
	Years	*Cords*		*Inches*
70	20	17		5.4
	30	31	1,000	7.8
	40	42	3,500	9.6
	50	50	6,500	10.9
	60	55	10,000	12.1
	70	59	12,500	13.0
	80	62	15,000	13.8
80	20	22		6.2
	30	38	2,000	8.7
	40	51	6,000	10.7
	50	60	11,500	12.2
	60	66	16,000	13.6
	70	70	19,500	14.6
	80	73	22,000	15.5
90	20	27		6.9
	30	46	4,000	9.6
	40	61	10,000	11.7
	50	71	16,500	13.6
	60	78	22,000	15.0
	70	82	26,000	16.2
	80	85	29,000	17.2
100	20	32	500	7.4
	30	53	6,000	10.4
	40	71	14,500	12.8
	50	84	23,000	14.7
	60	92	29,500	16.2
	70	96	33,000	17.6
	80	100	35,500	18.6

[1] Height in feet of the dominant and codominant trees at age of 50 years.
[2] Average age of dominant and codominant trees.
[3] Diameter of the average-sized tree at breast height.

Wildlife

Birds and animals frequent areas that provide the kinds of food and cover that they prefer or that is necessary for their survival. In Prince Georges County, many areas are suitable as habitats for several kinds of wildlife. About 43 percent of the land area is well suited as a habitat for open-land wildlife, and about 32 percent is fairly well suited. *Open-land wildlife* includes rabbits, some deer, and quail, pheasants, and other kinds of upland birds. About 95 percent of the land area is at least fair as a habitat for woodland wildlife, and more than 85 percent is well suited. *Woodland wildlife* consists of deer, squirrel, turkey, and other animals and birds. About 3 percent of the county is well suited as a habitat for wetland wildlife, and 3 percent is fair. Wetland wildlife includes raccoon and muskrat, and rail, duck, geese, and other waterfowl.

In table 12 the soils of the county are rated according to their suitability for kinds of plants and water developments that are used by wildlife and according to their suitability as habitats for open-land wildlife, woodland wildlife, and wetland wildlife. The ratings given in table 12 are *good*, or above average; *fair*, or average; *poor*, or below average; or *not suited*. The following gives examples of the plants in the plant categories of

table 12 and tells something about the properties of soils suitable for water developments.

Grain and seed crops: Valuable for wildlife are corn, sorghum, millet, soybeans, buckwheat, cowpeas, wheat, oats, rye, barley and other grain grown for seed or for grain.

Legumes and grasses: Lespedeza, alfalfa, alsike clover, ladino clover, red clover, tall fescue, bromegrass, bluegrass, and timothy are planted grasses and legumes valued as wildlife food and cover.

Wild herbaceous upland plants: Among these plants that wildlife use for food and cover are panicgrass and other native grasses, partridge-peas, beggarticks, various native lespedezas, and other native herbs.

Hardwood trees and shrubs: Some hardwood trees and shrubs are valuable for wildlife because they grow vigorously and produce a good crop when they are planted or when they seed naturally. Among these are sumac, dogwood, persimmon, sassafras, hazelnut, shrub lespedeza, multiflora rose, autumn-olive, wild cherry, various oaks and hickories, bayberry, blueberry, huckleberry, highbush cranberry, blackhaw, sweetgum, and various hollies.

Coniferous trees and shrubs: Valuable for wildlife food and cover are Virginia pine, loblolly pine, shortleaf pine, red pine, Scotch pine, pond pine, Norway spruce, redcedar, and Atlantic white-cedar. In table 12 the soils are rated on the basis

TABLE 12.—*Suitability of soils for elements*

[Clay pits (Cg), Gravel and borrow pits (Gp), and Made

Soil series and map symbols	Elements of wildlife habitat				
	Grain and seed crops	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs
Adelphia:					
AdA, AhA	Fair	Good	Good	Good	Poor
AdB2, AdC2, AhB2	Fair	Good	Good	Good	Poor
Aura:					
AuB2, AuC2, AuC3, AuD, SlD.	Poor	Fair	Fair	Fair	Fair
AvE, SlE	Not suited	Poor	Poor	Poor	Fair
Beltsville:					
BeA, BlA	Fair	Good	Good	Good	Poor
BeB2, BeC2, BlB2, BlC2, BmB, BmC.	Good	Good	Good	Good	Poor
BlC3	Poor	Fair	Fair	Good	Poor
BlD3	Not suited	Poor	Good	Good	Poor
Bibb:					
Bn, Bo, Br	(1)	(2)	(2)	Good	(3)
Butlertown:					
BtB2	Good	Good	Good	Good	Poor
Chillum:					
CaB2, CaC2, CaC3, CaD2, CbB, CbC.	Fair	Fair	Fair	Fair	Fair
CbE	Poor	Poor	Fair	Fair	Fair
Christiana:					
CdA, CdB2, CdC2, CeA, CeB2, CeC2, CfB, CfC.	Fair	Good	Good	Good	Poor
CcC3, CdD2, CeD2	Poor	Fair	Fair	Good	Poor
CcD3, CcE3, CfE	Not suited	Poor	Good	Good	Fair
Codorus:					
Ch, Ck	(4)	(5)	(5)	Good	(6)
Colemantown:					
Cl	Poor	Fair	Fair	Good	Fair
Collington:					
CmA, CmB2, CmC2, CoA, CoB2, CpB, CpC.	Fair	Good	Good	Good	Poor
CmC3, CmD2, CoC3, SlD	Poor	Fair	Good	Good	Poor
CmD3, CmE2, CmE3, SlE	Not suited	Poor	Good	Good	Poor
CnB2, CnC2	Fair	Fair	Fair	Fair	Fair
CnD2	Poor	Poor	Fair	Fair	Poor
Comus:					
Cr	(6)	(5)	(5)	Good	(6)
Croom:					
CsB2, CsC2, CsC3, CtB2, CtC2, CtC3, CtD2, CuB, CuC.	Poor	Fair	Fair	Fair	Fair
CuE, AvE	Not suited	Poor	Fair	Fair	Fair

See footnotes at end of table.

of the rapid growth and dense foliage of young trees, not on the size of mature trees and shrubs. A soil that is well suited for growing Christmas trees is well suited for growing coniferous trees that are good for wildlife.

Wetland plants grown for food and cover: Examples of plants that provide food and cover for waterfowl and fur-bearing animals are smartweed, wildrice, barnyard grass, bulrush, pondweed, duckweed, arrow-arum, pickerelweed, waterwillow, cattail, and various sedges.

Shallow water developments: The suitability of a soil for shallow impoundments depends on the ease or difficulty in controlling the water. In or on soils suitable for these impoundments, the water can be controlled at a level ranging from the natural water table to within 2 feet of it.

Excavated ponds: The suitability of a soil for constructing excavated ponds depends on how well the pond is supplied by the ground water. These ponds must not depend upon runoff from surrounding areas, though that water may help to keep the pond at the desired level.

Farm ponds of the impounded type are not included in table 12, but they may be important for producing fresh water fish. If fish are produced, part of the farm pond should be at least 6 feet deep. Listed in table 9 in the subsection "Engineering Uses of the Soils" is the kind or kinds of farm ponds—excavated or impounded—suitable for each soil in the county.

of wildlife habitats and for kinds of wildlife

land (Ma) are variable and are not included in this table]

Elements of wildlife habitat—Continued			Kinds of wildlife		
Wetland plants grown for food and cover	Shallow water developments	Excavated ponds	Open-land	Woodland	Wetland
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
(3)	(1)	Not suited	(4)	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
(6)	Poor	(1)	(5)	Good	(7).
Good	Good	Good	Fair	Good	Good.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Not suited	Not suited	(8)	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.

TABLE 12.—*Suitability of soils for elements of wildlife*

Soil series and map symbols	Elements of wildlife habitat				
	Grain and seed crops	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs
Donlonton:					
DoA	Fair	Good	Good	Good	Poor
DoB2	Good	Good	Good	Good	Poor
Elkton:					
Ek	Poor	Fair	Fair	Good	Fair
ElB	Poor	Fair	Good	Good	Poor
Elsinboro:					
EmA, EmB2, EnA, EnB2, EnC2, EuB.	Fair	Good	Good	Good	Poor
Evesboro:					
GeB, GeC, ReB, ReC, WeB2, WeC2, WeC3.	Poor	Poor	Poor	Poor	Good
ReD, WeD3	Not suited	Not suited	Poor	Poor	Fair
Fallsington:					
Fl, Fs, Fu	Poor	Fair	Fair	Good	Fair
Galestown:					
GaB, GaC, GdB, GdC, GeB, GeC, GmB, GmC.	Poor	Poor	Poor	Poor	Good
Glenelg:					
GnC2, GoB	Fair	Good	Good	Good	Poor
Hatboro:					
Ha	(1)	(2)	(2)	Good	(3)
Howell:					
HoB2, HoC2, HwB2, HwC2	Fair	Good	Good	Good	Poor
HcC3, HwD2	Poor	Fair	Fair	Good	Poor
HcD3, HwE2	Not suited	Poor	Good	Good	Fair
Hyde:					
Hy	Not suited	Poor	Not suited	Fair	Not suited
Iuka:					
Ik, ImA, ImB, In, IoA, IoB, Iu, Ix.	(4)	(5)	(5)	Good	(6)
Johnston:					
Jo, Ju	Not suited	Poor	Poor	Good	(9)
Keyport:					
KeA, KpA	Fair	Good	Good	Good	Poor
KeB2, KeC2, KpB2, KpC2, KuB.	Poor	Fair	Fair	Good	Fair
KrC3	Not suited	Poor	Good	Good	Fair
Klej:					
Ky	Fair	Good	Good	Fair	Poor
Leonardtown:					
LeA	Fair	Fair	Fair	Fair	Poor
LeB	Fair	Fair	Fair	Fair	Poor
Magnolia:					
MfB2, MgB2, MgC2	Fair	Good	Good	Good	Poor
Manor:					
MhB2, MhC2, MhD2, MkC.	Poor	Fair	Fair	Fair	Fair
MhF2	Not suited	Poor	Fair	Fair	Fair
Marr:					
MlA, MlB2, MlB3, MlC2	Fair	Good	Good	Good	Poor
MlC3	Poor	Fair	Fair	Good	Poor
MlD3, MlE	Not suited	Poor	Good	Good	Fair
Matapeake:					
MmA, MmB2, MnA, MnB2, MnC2, MoB2, MpB, MpC.	Fair	Good	Good	Good	Poor
MnC3, MnD2	Poor	Fair	Fair	Good	Poor
Matawan:					
MrA	Fair	Good	Good	Good	Poor
MrB2, MrC2, MsB	Fair	Fair	Good	Good	Poor
MsA	Fair	Good	Good	Fair	Poor
Mattapex:					
MtA, MuA	Fair	Good	Good	Good	Poor
MtB2, MuB2, MvB	Fair	Good	Good	Good	Poor
Mixed alluvial land:					
Mw	(1)	(2)	(2)	Good	(3)

See footnotes at end of table.

habitats and for kinds of wildlife—Continued

Elements of wildlife habitat—Continued			Kinds of wildlife		
Wetland plants grown for food and cover	Shallow water developments	Excavated ponds	Open-land	Woodland	Wetland
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Good	Good	Good	Fair	Good	Good.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Poor	Not suited.
Not suited	Not suited	Not suited	Not suited	Poor	Not suited.
Good	Good	Good	Fair	Good	Good.
Not suited	Not suited	Not suited	Poor	Poor	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
(3)	(1)	Not suited	(4)	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Good	Good	Good	Not suited	Poor	Good.
(6)	Poor	(1)	(5)	Good	(7).
(5)	(1)	Not suited	Poor	Good	(2).
Poor	Poor	Poor	Good	Good	Poor.
Poor	Not suited	Not suited	Fair	Good	Not suited.
Poor	Poor	Poor	Poor	Good	Not suited.
Poor	Poor	Poor	Good	Fair	Poor.
Fair	Fair	Fair	Fair	Fair	Fair.
Poor	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Poor	Poor	Poor	Good	Fair	Poor.
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.
(3)	(1)	Not suited	(4)	Good	Poor.

TABLE 12.—*Suitability of soils for elements of wildlife*

Soil series and map symbols	Elements of wildlife habitat				
	Grain and seed crops	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs
Monmouth:					
MyA, MyB2, MyC2	Fair	Good	Good	Good	Poor
MxC3, MyD2	Poor	Fair	Fair	Good	Poor
MxD3	Not suited	Poor	Good	Good	Fair
Muirkirk:					
MzB2, MzC2	Fair	Fair	Fair	Fair	Fair
Ochlockonee:					
OcA, OcB, OcC, OhA, OhB, Ok.	(1)	(1)	(1)	Good	(1)
Othello:					
Ol, Ot	Poor	Fair	Fair	Good	Fair
Plummer:					
Pr	Poor	Poor	Fair	Fair	Fair
Rumford:					
RdA, RdB2, RdC2, ReB, ReC.	Fair	Fair	Fair	Fair	Fair
RdC3, RdD2, ReD	Poor	Poor	Fair	Fair	Poor
Rutlege:					
Pr	Poor	Fair	Fair	Good	Fair
Sandy land, steep:					
SaE	Not suited	Not suited	Poor	Poor	Fair
Sandy and clayey land:					
ScB, ScC	Poor	Fair	Fair	Fair	Poor
ScD	Not suited	Not suited	Fair	Fair	Poor
Sassafras:					
SfB2, SfC2, SgB2, SgC2, ShA, ShB2, ShC2, ShC3, SkB, SkC.	Fair	Good	Good	Good	Poor
SfD2, SgC3, SgD2, SlD	Poor	Fair	Fair	Good	Poor
SgD3, SgE, SkE, SlE	Not suited	Poor	Good	Good	Fair
Shrewsbury:					
SmA, SnA, So	Poor	Fair	Fair	Good	Fair
SmB	Poor	Fair	Fair	Good	Fair
Silty and clayey land:					
SpB, SpC	Poor	Fair	Fair	Fair	Poor
SpE	Not suited	Not suited	Fair	Fair	Poor
Sunnyside:					
StB2, StC2, SuB2, SuC2, SwB, SwC.	Fair	Good	Good	Good	Poor
StD2, SuD2, SvD3	Poor	Fair	Fair	Good	Poor
StE, SvC3	Not suited	Poor	Good	Good	Fair
Swamp:					
Sx	Not suited	Poor	Not suited	Fair	Not suited
Tidal marsh:					
Tm	Not suited	Not suited	Not suited	Not suited	Not suited
Westphalia:					
WaA, WaB2, WaB3, WaC2, WbB2, WbC2, WeB2, WeC2.	Fair	Good	Good	Good	Poor
WaC3, WaD2, WbD2, WeC3	Poor	Fair	Fair	Good	Poor
WaD3, WeD3	Not suited	Poor	Good	Good	Fair
Woodstown:					
WoA, Wu	Fair	Good	Good	Good	Poor
WoB2, WoC2	Fair	Good	Good	Good	Poor

[1] Poor in occasionally flooded areas; not suited in frequently flooded areas.

[2] Fair in occasionally flooded areas; poor in frequently flooded areas.

[3] Fair in occasionally flooded areas; good in frequently flooded areas.

[4] Fair in occasionally flooded areas; not suited in frequently flooded areas.

[5] Good in occasionally flooded areas; poor in frequently flooded areas.

habitats and for kinds of wildlife—Continued

Elements of wildlife habitat—Continued			Kinds of wildlife		
Wetland plants grown for food and cover	Shallow water developments	Excavated ponds	Open-land	Woodland	Wetland
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	([6])	Good	Not suited.
Good	Good	Good	Fair	Good	Good.
Good	Fair	Good	Fair	Fair	Good.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Good	Fair	Good	Fair	Good	Good.
Not suited	Not suited	Not suited	Not suited	Poor	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Good	Good	Good	Fair	Good	Good.
Poor	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Fair	Not suited.
Not suited	Not suited	Not suited	Poor	Fair	Not suited.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Good	Good	Fair	Not suited	Poor	Good.
Good	Fair	Not suited	Not suited	Not suited	Fair.
Not suited	Not suited	Not suited	Good	Good	Not suited.
Not suited	Not suited	Not suited	Fair	Good	Not suited.
Not suited	Not suited	Not suited	Poor	Good	Not suited.
Poor	Poor	Poor	Good	Good	Poor.
Not suited	Not suited	Not suited	Good	Good	Not suited.

[6] Poor in occasionally flooded areas; good in frequently flooded areas.

[7] Poor in occasionally flooded areas; fair in frequently flooded areas.

[8] Good in occasionally flooded areas; not suited in frequently flooded areas.

[9] Good in occasionally flooded areas; fair in frequently flooded areas.

Table 12 also rates the soils according to their suitability for the three kinds of wildlife in the county. These ratings are based on the ratings given in this table for the suitability of the soils for habitat elements of the particular kind of wildlife. For example, the ratings of the suitability of the soils for open-land wildlife is based on their suitability for grain and seed crops, legumes and grasses, and wild herbaceous upland plants. The ratings for the other two kinds of wildlife are based on the suitability of the soils for the elements of their habitat.

Formation and Classification of Soils

This section consists of four main parts. In the first part the factors of soil formation are discussed as they relate to the formation of soils in Prince Georges County. The second part explains the interrelationships of soil series in the county, and the third part discusses the genesis and morphology of soils. In the fourth part each soil series represented in the county is placed in its respective family, subgroup, and order of the current system for classifying soils and also is placed in its respective great soil group and order of the classification system used in 1938 and later revised.

For further information about the current system for classifying soils, refer to "Soil Classification, a Comprehensive System" (*6*).

Factors in Soil Formation

Soils are the products of soil-forming processes acting upon materials altered or deposited by geologic forces. The factors that contribute to the differences among soils are climate, plant and animal life, parent material, topography, and time. Climate and plant and animal life, particularly vegetation, are the active forces in soil formation. Their effect on parent material is modified by topography and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place. In some places one factor dominates in the formation of a soil and determines most of its properties but normally the interaction of all factors determines the kind of soil that develops in any given place.

Climate

Climate is important in the formation of soils because it influences the weathering of minerals. Weathering is more rapid under a warm, humid climate that it is under a cold or a dry climate. The type and abundance of vegetation are influenced by the amount of precipitation and the length of the growing season. Precipitation also affects the translocation and leaching of some products of weathering. Hard rains and frequent showers may cause excessive erosion.

Prince Georges County has the humid, temperate climate that is typical of the eastern United States. Facts about the temperature and precipitation are given in tables 1 and 2 in the section "General Nature of the County."

The climate is nearly the same throughout the county, and precipitation is rather uniformly distributed during the year. In winter the precipitation is usually in the form of light snows and showers, and in other seasons it comes as light, prolonged rains or as quick, hard showers. Winter is moderately cold and sometimes wet; summer is usually hot and humid.

This humid, temperate climate has caused all the soils of the county to be strongly weathered, leached, acid, and comparatively low in supply of plant nutrients.

Plant and animal life

Before the county was settled, the native vegetation consisted mainly of hardwoods, but there also were some coniferous trees. These plants had a major influence on the development of the soils. In addition, the activities of micro-organisms, earthworms, larvae, rodents, and other forms of animal life were important in the cycle of decay and regeneration of plants.

Hardwood trees and other plants take up minerals from the soil and store them in their roots, stems, and leaves. When these plants or parts of them decay, the minerals reenter the soil and are again used by plants. Unless disturbed, this cycle continues through the years.

Soil development also is affected by plant roots, which penetrate soil material to various depths, generally increase its porosity, and may break or split coarse fragments and particles. Organic acids produced by plants and their decay react on basic minerals contained in the parent material. Minerals taken into solution or suspension may be leached from a soil or translocated within it.

As agriculture developed in Prince Georges County, the activity of man influenced soil formation. Forests were cleared, and new kinds of plants were introduced. Cultivation and artificial drainage changed some characteristics of soils in the county.

Man's activity has caused an accelerated loss of soil through erosion. Because of this loss, the soil in many areas has been thinned and otherwise has been changed. Some of the material washed from sloping areas has been deposited in depressions and on flood plains. Formed in such material are young or immature soils.

Parent material

Most of the soils in the county formed in sediments transported by water, wind, or the force of gravity, or by a combination of these, into the area known as the Atlantic Coastal Plain. In places along the Montgomery County line, however, there are soils that formed in residuum weathered from the underlying bedrock, which is soft, micaceous, muscovitic schist of the Pre-Cambrian period. This soft schist has weathered to a depth of as much as 10 feet or more, and the residuum is parent material for the Glenelg and Manor soils.

The Coastal Plain in Prince Georges County consists of sedimentary formations of clay, sand, greensand marl, silt, and diatomaceous earth that range in geologic age from Cretaceous to Recent (*3*). Most of the soils formed in material weathered from these formations and are easily associated with them because of inherited characteristics. Thus, the red clays of the Patapsco formation are evident in the Christiana soils, the olive-green to brown, glauconitic sands of the Aquia formation are apparent in the Collington soils, and the fine, smooth, yellow sands of the Miocene epoch are evident in the

Westphalia soils. Many other soils have characteristics inherited from their associated geologic formations.

The oldest of these sedimentary formations are those of the Cretaceous system. They consist of gray and yellow sand; red, brown, and gray clay with nodules of ironstone; and variegated red and yellow sand, clay, and fine gravel interbedded with layers of clay. In places these materials are capped by remnants of Pleistocene sand, gravel, clay, or sandy clay. Where the Lower Cretaceous materials have been exposed to weathering, they form the parent material for the Christiana and Sunnyside soils and for the subsoil of the Muirkirk soils.

The parent material of the Collington, Monmouth, Adelphia, Donlonton, Shrewsbury, and Colemantown soils is strongly influenced by glauconitic sand and silt of the Aquia and Monmouth formations. Parent material of the Westphalia, Marr, and Howell soils is smooth, yellow fine sand, silt, clay, and diatomaceous earth of the Miocene epoch.

The Pleistocene deposits of coarse and fine sand, silt, clay, and gravel are exposed to a varying depth over the county and form the parent material of the Sassafras, Elkton, Fallsington, Keyport, and Woodstown soils. The gravelly sand and clay of the Croom and Aura soils consist of river outwash deposited in Pliocene or early Pleistocene time. Soils of the Galestown, Lakeland, Klej, Plummer, and Rutlege series formed in sandy Pleistocene deposits. These coarse-textured materials also are the source of the surface layer, or A horizon, in the Muirkirk soils and probably in the Matawan soils.

The Chillum, Beltsville, and Leonardtown soils developed in a thin silty mantle, probably loessal, that was deposited over sediments of both the Pleistocene and the Lower Cretaceous geologic systems.

The Butlertown soils developed in a thick deposit of silt, mostly on high terraces along rivers, and the Matapeake, Mattapex, and Othello soils developed in a silty mantle over loose sand.

Magnolia soils formed in highly oxidized fine sand, silt, and clay that probably were deposited by the Potomac River during early or Pre-Pleistocene time. Elsinboro soils formed in old micaceous alluvial deposits on low terraces along the Patuxent River.

The materials most recently deposited are alluvial sediments on flood plains, in depressions, and on low stream terraces. These sediments are the parent material of the Codorus, Comus, Iuka, Bibb, Ochlockonee, Johnston, and Hatboro soils.

Topography

Topography, or relief, controls surface drainage and affects percolation of water through the soil and into the underlying material. It affects the depth of soil and some of the soil-forming processes, and it has some effect on the dominant kind of vegetation.

Soils formed on steep slopes normally have weakly expressed horizons, and their solum commonly is thin because much of it is eroded away almost as rapidly as it forms. Soils in low depressions and on flood plains generally have impeded drainage to some degree. Root penetration, as a factor in soil formation, is limited in shallow, steep, and imperfectly drained soils.

In Prince Georges County the Piedmont Plateau is moderately dissected and is rolling to hilly. Where the smaller drainageways join the larger streams and rivers, valleys with steep walls have been formed.

The Coastal Plain is gently rolling in the northern part of the county and, in the southern part, is a partly dissected upland plateau. Along the edges of this plateau, where downcutting by streams has been active, the slopes are stronger and there are many young, steep-walled valleys. Streams of the Coastal Plain flow slowly through broad valleys and empty into the Patuxent or the Potomac River. Both of these rivers are adjoined by low, broad, nearly level terraces. Large areas of recently deposited material form tidal marshes in the rivers.

Differences in topography can account for some differences between soils formed in the same or similar material. This is illustrated by the Marr and the Westphalia soils, both of which formed in smooth fine sand and finer material of the Miocene geologic series. The gently sloping to moderately sloping Marr soils have a thick solum and a strongly expressed argillic horizon. In contrast, the strongly sloping to steep Westphalia soils have a much thinner solum and a definite but not strongly expressed argillic horizon. The differences between soils of these two series are caused mainly by topography and its effect on the rate of geologic and accelerated erosion.

Time

Time is important in the formation of soils. If the factors of soil formation have operated long enough to form well-defined, genetically related horizons, and a soil that is in equilibrium with its environment, the soil is considered mature. However, if the soil shows little or no horizonation, and if the soil-forming processes are still active, the soil is considered immature. Many soils range in maturity between these extremes.

Soils that formed in the same kind of parent material but in areas of different topography do not necessarily mature in the same length of time. On steep slopes, for example, no definite horizons have had time to develop, because the soil has been removed by erosion almost as rapidly as it has formed. In less strongly sloping areas, there is time for some soil development.

Soils formed in material that is resistant to weathering require more time to reach maturity than soils formed in easily weathered material. On flood plains the development of genetically related horizons may be slowed or prevented if alluvium is still being deposited frequently.

The Butlertown soils are mature soils in which the horizons are well defined and genetically related, the rate of weathering has far exceeded that of geologic erosion, and the soils generally are in equilibrium with their environment. The Westphalia soils are only partly mature because they occur in areas where the rate of erosion is nearly that of weathering. The Comus soils are immature because the material in which they formed is recently deposited and is constantly being renewed.

Interrelationships of Soil Series

In table 13 the soil series of Prince Georges County are grouped to show the relationships in position, parent material, and drainage. Most of the soils are on uplands or terraces, but some are on flood plains, in depressions, or on foot slopes.

TABLE 13.—*Soil series arranged to show relationships in position, parent material, and drainage*

SOILS OF UPLANDS AND TERRACES

Parent material	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained [1]	Poorly drained	Very poorly drained
Residuum from soft mica schist		Manor	Manor, Glenelg			
Sand and loamy sand	Galestown, Evesboro	Galestown, Evesboro		Klej	Plummer	Rutlege.
Sand, silt, and clay			Sassafras, Sunnyside	Woodstown	Fallsington	
Sand and a little clay and silt			Rumford			
Thick deposits of silt			Matapeake	Butlertown	Othello	
Thin mantle of silt over sand			Matapeake	Mattapex	Othello	
Old gravelly sediments		Croom	Aura			
Silt over compact sandy and gravelly sediments.			Chillum	Beltsville	Leonardtown	
Clay or silty clay			Christiana, Magnolia	Keyport	Elkton	Hyde.
Sand over clay, silty clay, or fine sandy clay.		Muirkirk		Matawan		
Miocene clay, silt, and fine sand			Howell	Keyport	Elkton	Hyde.
Miocene fine sand and silt			Marr, Westphalia			
Sand and silt with a moderate glauconite content.			Collington	Adelphia	Shrewsbury	
Sandy clay with a high glauconite content.			Monmouth	Donlonton	Colemantown	
Old alluvium from crystalline and sedimentary rocks.			Elsinboro			

SOILS OF FLOOD PLAINS, FOOT SLOPES, AND DEPRESSIONS

Recent alluvium from crystalline rocks.			Comus	Codorus	Hatboro	
Recent alluvium from old sediments			Ochlockonee	Iuka	Bibb	Johnston.

[1] These soils are dominantly moderately well drained, but parts of some series extend into the somewhat poorly drained range.

Soils of the uplands and terraces.—With few exceptions, the soils on uplands and on terraces developed from the same kind of parent material. Position of the landscape does not, in itself, affect the classification of soils. For example, soils of the Sassafras, Collington, Galestown, and some other series developed on alluvial terraces and in older sediments on uplands.

The soils on uplands have developed in residuum weathered from bedrock on the Piedmont Plateau and in Pleistocene or older sediments on the Coastal Plain. The soils on terraces—all of which, in Prince Georges County, are within the Coastal Plain—have developed mainly in Pleistocene sediments, though in some places the sediments may have been deposited during the Pliocene epoch on what are now terraces.

Soils of flood plains, foot slopes, and depressions.—These soils developed in recent alluvium and, in most areas, are periodically covered with fresh material. Soils in depressions and on foot slopes receive local alluvium that washes or rolls from adjacent higher slopes. Soils on flood plains are occasionally or frequently covered by floodwater that lays down fresh material.

In some places the material is of uniform texture and generally consists of fine sand or silt. In other places it is made up of interstratified or otherwise mixed materials, chiefly sand, silt, clay, and even gravel.

Little soil development is evident in most areas of these deposits, though generally there is an A horizon that locally is covered with thin overwash laid down only recently. In soils that are not at least well drained, mottling or fairly distinct gleying occurs within 3 feet of the surface. In none of the soils is there a horizon of clay accumulation, for the soil material has not been in place long enough.

Genesis and Morphology of Soils

Most soils of the county have strongly differentiated horizons. The exceptions, in which horizonation is weak or lacking, are the young alluvial soils and the soils that consist mainly of quartz sand.

The differentiation of horizons in the soils is the result of several soil-forming processes. The most important of these are the following: (1) Accumulation of organic matter, (2) leaching of carbonates and of salts more soluble than calcium carbonate, (3) chemical weathering of the primary minerals of parent material into silicate clay minerals, (4) translocation of these silicate clay minerals, and probably of some silt-sized particles, from one horizon to another, and (5) chemical change and transfer of iron.

In the formation of most soils in the county, several of these processes have interacted to a varying degree. In some soils perhaps only one or two processes have been active and, in some, only to a slight degree.

Some organic matter has accumulated in all the soils to form an A1 horizon. In many places this horizon has eroded away or has been mixed with material from underlying horizons through cultivation. The content of organic matter varies in the different soils and ranges from very low to very high. Sandy soils, such as the Evesboro and Galestown, have a weak A1 horizon that contains little organic matter, but the Hyde soils have a thick, prominent A1 horizon with a very high organic-matter content.

Most soils in Prince Georges County formed in unconsolidated sediments. The leaching of carbonates and other salts probably took place in their parent material even before the material was deposited. At any rate, all of the soils, including those formed in residuum, have been completely leached of carbonates and salts and are naturally acid. Many of them are very strongly acid or extremely acid.

The weathering of primary minerals to silicate clay minerals, largely by the process of hydrolysis, results finally in the production of kaolinitic clays. No complete study of clay minerals has been made in Prince Georges County, but kaolinite is recognized as the most common and most characteristic clay mineral in mature soils of the county. Other clays, such as illite, montmorillonite, and probably halloysite, occur in smaller quantities in some of the soils.

The translocation and the development in place of silicate clay minerals have contributed strongly to the formation of horizons in soils of the county. Silicate clays formed in the A1 and A2 horizons have been largely translocated to the lower B horizon by percolation and have been at least partly immobilized. This process contributes to the formation of a textural, or a B2t, horizon. The process may also be active to a limited degree in soils that do not have a distinct B2t horizon. Silicate clays may also develop within a B2t horizon and be partly or completely immobilized as quickly as they are formed. For example, translocation of silicate clays has occurred in the Sassafras and Collington soils, and translocation and in-place development of silicate clays have taken place in the Christiana soils.

Gleying, or the process of chemical reduction and transfer of iron, occurs in soils with impeded drainage. The naturally wet soils of the county have some degree of gleying in one or more of their horizons. Elkton and Colemantown soils are examples of soils that have been affected by gleying because the water table is high.

Excessive accumulation of clay minerals and of silt in the lower subsoil generally results in the formation of a compact layer commonly called a fragipan. This fragipan is a part of the B horizon in most soils and is designated by the symbol Bx. It may extend into the underlying C material, where it is recognized as a Cx horizon. A soil may therefore have a fragipan in either the B or the C horizon, or in both.

Because a fragipan generally is slowly permeable, a temporary perched water table can form above it while deeper strata of the soil remain relatively dry. The Beltsville soils have a strongly developed fragipan.

Iron that has been reduced in areas where the soil is poorly aerated generally becomes mobile and may be removed from the soil. Part of the mobile iron moves either within the horizon where it originated or to another horizon. Part of this iron may be segregated and reoxidized to form the red, yellowish-red, strong-brown, or yellowish-brown mottles that are common in some horizons of soils having impeded drainage. The reduction, segregation, and reoxidation of iron have occurred in horizons of the Woodstown and Adelphia soils.

When silicate clay forms from primary materials, some iron generally is freed as hydrated oxide. Depending on the degree of hydration, such oxides normally are strongly red. In soils formed in parent material that is highly quartzose, is coarse textured, and lacks sufficient silicate clay minerals to form a B2t horizon, only a small amount of hydrated oxide is required to color the soil material. Such soils generally have a highly colored cambic B horizon. The Manor soils of Prince Georges County lack a B2t horizon but do have a distinctly colored cambic B horizon.

In most well-developed and freely aerated soils with a B2t horizon, hydrated iron oxide may color the horizon as strongly as it does a nontextural B horizon. For example, in the Monmouth soils, which have a B2t horizon of olive hues and low chromas and values, there is little or no visible evidence of free iron oxide. At the other extreme are the Christiana and Magnolia soils, which have red hues, distinctly higher chromas, and generally higher values than the Monmouth soils. The B2t horizon in the Christiana and Magnolia soils is very strongly colored by free iron oxide.

Classification of Soils

Soils are classified so that we may more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through the use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus, in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and applied in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. They are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils are now in general use in the United States. One of these is the 1938 system (*8*), with later revisions (*7*). The other, the current system, was placed in general use by the Soil Conservation Service in 1965. The reader who is interested in the current system should search the latest literature (*6*, *4*). In this report the classes in the newer system, and the orders and great soil groups of the older system, are given in table 14. The classes in the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridi-

sols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions are the Entisols and Histosols, which occur in many different climates. Table 14 shows the three soil orders in Prince Georges County—Entisols, Inceptisols, and Ultisols.

SUBORDER: Each order is subdivided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. The suborder is not shown in table 14 for the current classification system.

GREAT GROUP: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated. The features used are the self-mulching properties of clays, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like. The great group is not shown in table 14 for the current classification system. The name of the great group is the last word in the name of the subgroup.

SUBGROUPS: Great groups are subdivided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Normudult (a typical Normudult).

FAMILIES: Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or to the behavior of soils where used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. An example of a family is the fine loamy, mixed, mesic family of Typic Normudults.

In table 14, each soil series in Prince Georges County is placed in its family, subgroup, and order of the current classification system, and in its great soil group and order of the revised 1938 system. A description of each soil series in the county, including a profile that is representative of the series, can be found in the section "Descriptions of the Soils."

TABLE 14.—*Soil series classified according to the current system of classification* [1] *and the revised 1938 system*

Series	Current classification			1938 classification	
	Family	Subgroup	Order	Great soil group	Order
Adelphia	Fine loamy, mixed, mesic	Aqualfic Normudults	Ultisols	Gray-Brown Podzolic	Zonal.
Aura	Fine loamy, mixed, mesic	Typic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Beltsville	Fine loamy, mixed, mesic	Typic Fragiudults	Ultisols	Gray-Brown Podzolic	Zonal.
Bibb	Coarse loamy, mixed, acid, thermic.	Cumulic Normaquepts	Inceptisols	Low-Humic Gley	Intrazonal.
Butlertown	Fine silty, mixed, mesic	Typic Fragiudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Chillum	Fine silty, mixed, mesic	Alfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Christiana	Clayey, kaolinitic, mesic	Typic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Codorus	Fine loamy, mixed, acid, mesic.	Aquic Cumulic Haplorthents.	Entisols	Alluvial	Azonal.
Colemantown	Clayey, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley	Intrazonal.
Collington	Fine loamy, mixed, mesic	Alfic Normudults	Ultisols	Gray-Brown Podzolic	Zonal.
Comus	Coarse loamy, mixed, acid, mesic.	Cumulic Haplorthents	Entisols	Alluvial	Azonal.
Croom	Loamy skeletal, mixed, mesic.	Typic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Donlonton	Clayey, mixed, mesic	Aqualfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Elkton	Clayey, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley	Intrazonal.
Elsinboro	Fine loamy, mixed, mesic	Typic Normudults	Ultisols	Gray-Brown Podzolic	Zonal.
Evesboro	Sandy, siliceous, acid, mesic.	Typic Quartzipsamments	Entisols	Regosol	Azonal.
Fallsington	Fine loamy, siliceous, mesic.	Typic Ochraquults	Ultisols	Low-Humic Gley	Intrazonal.
Galestown	Sandy, siliceous, acid, mesic.	Ultic Quartzipsamments	Entisols	Sols Bruns Acides	Intrazonal.
Glenelg	Fine loamy, micaceous, mesic.	Typic Normudults	Ultisols	Gray-Brown Podzolic	Zonal.

See footnote at end of table.

TABLE 14.—*Soil series classified according to the current system of classification* [1] *and the revised 1938 system*—Continued

Series	Current classification			1938 classification	
	Family	Subgroup	Order	Great soil group	Order
Hatboro	Fine loamy, mixed, acid, mesic.	Cumulic Normaquepts	Inceptisols	Low-Humic Gley	Intrazonal.
Howell	Clayey, mixed, mesic	Typic Normudults	Ultisols	Gray-Brown Podzolic	Zonal.
Hyde	Clayey, mixed, thermic	Typic Umbraquults	Ultisols	Humic Gley	Intrazonal.
Iuka	Coarse loamy, siliceous, acid, thermic.	Aquic Cumulic Haplorthents.	Entisols	Alluvial	Azonal.
Johnston	Fine loamy, mixed, acid, thermic.	Typic Humaquepts	Inceptisols	Humic Gley	Intrazonal.
Keyport	Clayey, mixed, mesic	Paraquic Normudults	Ultisols	Red-Yellow Podzolic intergrading toward Gray-Brown Podzolic.	Zonal.
Klej	Sandy, siliceous, acid, mesic.	Aquic Quartzipsamments	Entisols	Regosol	Azonal.
Leonardtown	Fine silty, mixed, mesic	Typic Fragiaquults	Ultisols	Planosol	Intrazonal.
Magnolia	Clayey, kaolinitic, thermic	Typic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Manor	Coarse loamy, micaceous, mesic.	Typic Dystrochrepts	Inceptisols	Sols Bruns Acides	Intrazonal.
Marr	Fine loamy, siliceous, mesic.	Typic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Matapeake	Fine silty, mixed, mesic	Alfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Matawan	Fine loamy, mixed, mesic	Aqualfic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Mattapex	Fine silty, mixed, mesic	Aqualfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Monmouth	Clayey, mixed, mesic	Alfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Muirkirk	Clayey, siliceous over kaolinitic, mesic.	Arenic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Ochlockonee	Coarse loamy, siliceous, acid, thermic.	Cumulic Haplorthents	Entisols	Alluvial	Azonal.
Othello	Fine silty, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley	Intrazonal.
Plummer	Sandy, siliceous, acid, thermic.	Typic Aquipsamments	Entisols	Regosol	Azonal.
Rumford	Coarse loamy, siliceous, thermic.	Typic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Rutlege	Sandy, siliceous, acid, thermic.	Typic Humaquepts	Inceptisols	Humic Gley	Intrazonal.
Sassafras	Fine loamy, siliceous, mesic.	Alfic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Shrewsbury	Fine loamy, mixed, mesic	Typic Ochraquults	Ultisols	Low-Humic Gley	Intrazonal.
Sunnyside	Fine loamy, siliceous, mesic	Typic Normudults	Ultisols	Red-Yellow Podzolic	Zonal.
Westphalia	Coarse loamy, siliceous, mesic.	Typic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.
Woodstown	Fine loamy, siliceous, mesic.	Paraquic Normudults	Ultisols	Gray-Brown Podzolic intergrading toward Red-Yellow Podzolic.	Zonal.

[1] Placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Glossary

AASHO soil classification system (engineering). A system of soil classification used by the American Association of State Highway Officials. In this system the soil material is classified according to its engineering properties, based on performance in highways, into seven principal groups, designated as A–1 through A–7.

Acidity. See Reaction, soil.

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; but that 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, such as a clod, crumb, block, or prism.

Alluvium. Soil material, such as sand, silt or clay, that has been deposited on land by streams.

Available moisture capacity. The difference between the amount of water in a soil at field capacity and the amount in the same soil at the permanent wilting point. Commonly expressed as inches of water per inch depth of soil, but sometimes expressed as inches of water per foot of soil.

Base (chemistry). Any of the positive, generally metallic elements or combinations of elements that make up the nonacid plant nutrients. The most important of these in plant nutrition are calcium (Ca), potassium (K), magnesium (Mg), and ammonium (NH_4).

Chroma. See Color, Munsell notation.

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.

Color, Munsell notation. A system for designating color by degrees of three simple variables—hue, value, and chroma. For example, the color notation 10YR 6/4 stands for a color with hue of 10YR, a value of 6, and a chroma of 4. Hue is the dominant spectral color; value relates to the relative lightness or darkness of color; and chroma is the relative purity or strength of color and increases as grayness decreases.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Cover crop. A close-growing crop grown primarily to improve and to protect the soil between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Cropland. Land regularly used for crops, except forest crops and permanent pasture. It includes rotation pasture, cultivated summer fallow, orchards, and other land ordinarily used for crops but temporarily idle.

Diversion. A structure, generally a terrace or a ditch, that is used to divert runoff from its natural course and, thus, to protect areas downslope from the effects of runoff.

Drainage. As a farm management operation, the removal of excess water from the soil. As a soil condition, the relative rapidity and extent of the removal of water from the soil, under natural conditions.

Erosion, soil. The wearing away of the land surface by wind, running water, and other geological agents. Accelerated erosion refers to the loss of soil material brought about by the activities of man. *Wind erosion* is the removal of soil material, generally sand, from dry, unprotected areas. The three classes of erosion by water are *sheet erosion* (the removal of soil material without the development of conspicuous channels), *rill erosion* (accelerated erosion by water that produces small channels), and *gully erosion* (accelerated erosion that produces large channels).

First bottom. The normal flood plain of a stream subject to occasional or frequent flooding.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The base of a slope, where there is a significant change in the grade or angle toward more nearly level land.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. It is generally mottled, is slowly or very slowly permeable to water, and has few to many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur 15 to 40 inches below the surface. See Hardpan.

Genesis, soil. The origin of a soil. In its genesis, a soil develops a solum, or A and B horizons, from unconsolidated parent material.

Glauconite. A granular, greenish mineral containing both iron and potassium. In Prince Georges County, it is a common component of sediments in deposits of which several distinctive soil series have developed. Locally called greensand.

Gleization, or gleying. The reduction, translocation, and segregation of soil compounds, notably of iron, usually in the subsoil or substratum, as a result of drainage and poor aeration; expressed in the soil by mottled colors dominated by gray. The soil-forming processes leading to the development of a gley soil.

Gravelly soil material. Material in which 15 to 50 percent, by volume, is rounded or angular fragments of rock that are not prominently flattened and are up to 3 inches in diameter. A single piece is a *pebble*. *Gravel* is a mass of pebbles.

Green-manure. A crop grown for the purpose of being turned under in an early stage of maturity or soon after maturity for soil improvement.

Hardpan. A hard layer within the soil profile. In Prince Georges County, hardpan is the common term for what is technically called a fragipan. An example of a hardpan is the Bx horizon of the Beltsville soils described in this survey.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes and that differs in one or more ways from adjacent horizons in the same profile. The major soil horizons, designated by capital letters, are defined as follows:

A horizon.—The mineral horizon at the surface. It contains an accumulation of organic matter, or has been leached of soluble minerals and clay, or shows the effects of both.

B horizon.—The horizon in which clay minerals have accumulated, or that has developed a characteristic blocky or prismatic structure, or that shows the effects of both processes.

C horizon.—The unconsolidated material immediately under the true soil. In chemical, physical, and mineral composition, it is presumed to be similar to the material from which at least part of the overlying solum has developed, unless the C designation is preceded by a Roman numeral.

R horizon.—Rock underlying the C horizon, or the B horizon if no C horizon is present.

Roman numerals are prefixed to the master horizon or layer designation (A, B, C, R) to indicate lithologic discontinuities or nonconforming layers, either within or below the solum. The first, or uppermost, material is not numbered, for the Roman numeral I is understood; the second, or contrasting, material is numbered II; and others are numbered III, IV, and so on, consecutively downward. Thus, a sequence from the surface downward might be A1, B1, B2, C1, IIC2, IIIR. Following are the small-letter symbols that may be part of a horizon designation (B2tg), and the meaning of these symbols.

g—strong gleying.	t—illuvial clay.
p—plow layer.	x—fragipan.

Hue. See Color, Munsell notation.

Interceptor. A drainage ditch or tile line, generally at or near the base of a slope, to protect areas downslope from the effects of seepage water.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by the height of the water table, either permanent or perched. Relative terms for expressing internal soil drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Leaching. The removal of soluble materials from soils or other materials by percolating water.

Loam. Soil having equal amounts of sand, silt, and clay.

Marine deposit. Material deposited in the waters of oceans and seas and exposed by elevation of the land or by the lowering of the water level. Most soils in Prince Georges County have developed in marine deposits.

Mechanical analysis of soil. The determination of the percentage of soil particles of all sizes—gravel, sand, silt, clay, and all their standard subdivisions, based on the mineral soil only, free of water and organic matter.

Morphology, soil. The physical constitution of the soil, including the texture, structure, consistence, color, porosity, and other physical, chemical, mineralogical, and biological properties of the various horizons that make up the soil profile.

Mottles. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in making food and tissue. Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil, and carbon, hydrogen, and oxygen obtained largely from the air and water, are plant nutrients.

Parent material. The weathered rock or partly weathered soil material from which a soil has formed; the C horizon.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. This quality depends primarily on the size and the distribution of pore spaces within the horizon. Ratings of permeability in inches per hour are *slow,* less than 0.20; *moderately slow,* 0.20 to 0.63; *moderate,* 0.63 to 2.00; *moderately rapid,* 2.00 to 6.3; *rapid,* 6.3.

pH value. A numerical means for designating acidity and alkalinity in soils and in other biological systems. See Reaction.

Poorly graded. A soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles in poorly graded soil material, density can be increased only slightly by compaction.

Productivity, soil. The present capability of a soil for producing a specified plant or sequence of plants under a specified system of management. It is measured in terms of output, or harvest, in relation to input of production for the specific kind of soil under a specified system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. See Parent material and Horizon, soil.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values or in words as follows:

	pH				*pH*		
Extremely acid	Below		4.5.	Mildly alkaline	7.4	to	7.8.
Very strongly acid.	4.5	to	5.0.	Moderately alkaline.	7.9	to	8.4.
Strongly acid	5.1	to	5.5.	Strongly alkaline.	8.4	to	9.0.
Medium acid	5.6	to	6.0.				
Slightly acid	6.1	to	6.5.	Very strongly alkaline.	9.1 and higher.		
Neutral	6.6	to	7.3.				

Relief. See Topography.

Runoff. The removal of water by flow over the surface of the soil.

Sand. As a soil separate, individual rock or mineral fragments 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz, but they may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Sediments. Rock, mineral, or soil particles of any size, transported and deposited by water, wind, ice, or gravity.

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 textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. 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 (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subgrade engineering. The substratum, consisting of material in place or fill material that is prepared for highway construction; does not include stabilized base course or actual paving material.

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer lying beneath the solum, or B horizon; the C or R horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil. In Prince Georges County this layer, or the normal plow depth, is about 10 inches thick.

Terrace (engineering). An embankment, or low ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that the water soaks into the soil or flows slowly to a prepared outlet without harm. Terraces are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

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 condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topography, or relief. Elevations or inequalities of the land surface, considered collectively.

Unified soil classification system (engineering). A soil classification system developed by the Corps of Engineers, U.S. Army. In this system soils are classified on the basis of texture and plasticity and on their performance as material for engineering construction. They are designated by pairs of letters, for example, SC and SM.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Value. See Color, Munsell notation.

V-type ditches. Ditches that are V-shaped and have smooth side slopes.

Water table. The highest part of the soil or underlying material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Well-graded soil (engineering). A soil consisting of particles that are well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Literature Cited

(1) American Association of State Highway Officials.
1961. standard specifications for highway materials and methods of sampling and testing. Ed. 8, 2 v., 401 and 617 pp., illus.

(2) Cooke, C. W., Martin, R. O. R., and Meyer, G.
1952. geology and water resources of prince georges county. State of Md., Dept. Geol., Mines and Water Resources, Bul. 10, 270 pp., illus.

(3) Otten, E. G.
1955. ground-water resources of the southern maryland coastal plain. State of Md., Dept. Geol., Mines and Water Resources, Bul. 15, 347 pp., illus.

(4) Simonson, Roy W.
1962. soil classification in the united states. Sci. 137: 1027–1034.

(5) Soil Survey Staff.
1951. soil survey manual. U.S. Dept. Agr. handbk. 18, 503 pp., illus.

(6) ———
1960. soil classification, a comprehensive system. U.S. Dept. Agr., 265 pp., illus. [Amendment issued in June 1964]

(7) Thorp, James, and Smith, Guy D.
1949. higher categories of soil classification: order, suborder, and great soil group. Soil Sci. 67: 117–126.

(8) United States Department of Agriculture.
1938. soils and men. U.S. Dept. Agr. Ybk., 1232 pp., illus.

(9) ———
1960. drainage guide for maryland, coastal plain. (In cooperation with Agr. Col., Univ. of Md.) [Mimeographed]

(10) Waterways Experiment Station, Corps of Engineers.
1953. the unified soil classification system. Tech. Memo. 3–357, 2 v. and appendix, 44 pp., illus.

GUIDE TO MAPPING UNITS

[For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs.

[See table 3, page 10, for approximate acreage and proportionate extent of the soils, and see table 10, page 142, for estimated yields. Use of soils in community development and for recreational facilities is discussed in the subsection beginning on page 67. The subsection beginning on page 87 discusses use of soils in engineering]

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
AdA	Adelphia fine sandy loam, 0 to 2 percent slopes	14	IIw-5	126	1	135	9	140	3	150
AdB2	Adelphia fine sandy loam, 2 to 5 percent slopes, moderately eroded	15	IIe-36	125	1	135	9	140	3	150
AdC2	Adelphia fine sandy loam, 5 to 10 percent slopes, moderately eroded	15	IIIe-36	130	1	135	9	140	9	152
AhA	Adelphia silt loam, 0 to 2 percent slopes	15	IIw-1	126	1	135	13	140	3	150
AhB2	Adelphia silt loam, 2 to 5 percent slopes, moderately eroded	15	IIe-16	125	1	135	13	140	3	150
AuB2	Aura gravelly loam, 2 to 6 percent slopes, moderately eroded	15	IIs-7	127	----	---	11	140	12	153
AuC2	Aura gravelly loam, 6 to 12 percent slopes, moderately eroded	16	IIIe-7	129	----	---	11	140	16	153
AuC3	Aura gravelly loam, 6 to 12 percent slopes, severely eroded	16	IVe-7	132	----	---	11	140	17	153
AuD	Aura gravelly loam, 12 to 20 percent slopes	16	IVe-7	132	----	---	11	140	16	153
AvE	Aura and Croom gravelly loams, 20 to 50 percent slopes	16	VIIe-2	133	----	---	--	---	16	153
BeA	Beltsville fine sandy loam, 0 to 2 percent slopes	17	IIw-9	127	6-1B	136	8	139	12	153
BeB2	Beltsville fine sandy loam, 2 to 5 percent slopes, moderately eroded	17	IIe-36	125	6-1B	136	8	139	12	153
BeC2	Beltsville fine sandy loam, 5 to 10 percent slopes, moderately eroded	17	IIIe-36	130	6-1B	136	8	139	16	153
BlA	Beltsville silt loam, 0 to 2 percent slopes	17	IIw-8	126	6-1A	136	11	140	12	153
BlB2	Beltsville silt loam, 2 to 5 percent slopes, moderately eroded	17	IIe-13	124	6-1A	136	11	140	12	153
BlC2	Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	18	IIIe-13	129	6-1A	136	11	140	16	153
BlC3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded	18	IVe-9	132	6-1A	136	11	140	17	153
BlD3	Beltsville silt loam, 10 to 15 percent slopes, severely eroded	18	VIe-2	133	6-1A	136	--	---	17	153
BmB	Beltsville-Urban land complex, 0 to 5 percent slopes	18	-----	---	6-1A	136	--	---	--	---
BmC	Beltsville-Urban land complex, 5 to 15 percent slopes	18	-----	---	6-1A	136	--	---	--	---
Bn	Bibb sandy loam	19	IIIw-6	130	11-B	137	10A	140	2	150
Bo	Bibb silt loam	19	IIIw-7	131	11-A	137	10	140	2	150
Br	Bibb-Urban land complex	19	-----	---	11-A	137	--	---	--	---
BtB2	Butlertown silt loam, 0 to 5 percent slopes, moderately eroded	20	IIe-16	125	2-A	135	13	140	11	152
CaB2	Chillum silt loam, 0 to 6 percent slopes, moderately eroded	21	IIs-7	127	----	---	11	140	7	151
CaC2	Chillum silt loam, 6 to 12 percent slopes, moderately eroded	21	IIIe-7	129	----	---	11	140	8	152
CaC3	Chillum silt loam, 6 to 12 percent slopes, severely eroded	21	IVe-7	132	----	---	11	140	17	153

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
CaD2	Chillum silt loam, 12 to 20 percent slopes, moderately eroded	21	IVe-7	132	-----	---	11	140	8	152
CbB	Chillum-Urban land complex, 0 to 6 percent slopes	21	-----	---	-----	---	--	---	--	---
CbC	Chillum-Urban land complex, 6 to 12 percent slopes	21	-----	---	-----	---	--	---	--	---
CbE	Chillum-Urban land complex, 12 to 35 percent slopes	21	-----	---	-----	---	--	---	--	---
CcC3	Christiana clay, 5 to 10 percent slopes, severely eroded	22	IVe-3	131	-----	---	14	141	17	153
CcD3	Christiana clay, 10 to 15 percent slopes, severely eroded	22	VIe-2	133	-----	---	--	---	17	153
CcE3	Christiana clay, 15 to 35 percent slopes, severely eroded	22	VIIe-2	133	-----	---	--	---	18	154
CdA	Christiana fine sandy loam, 0 to 2 percent slopes	22	IIs-28	128	-----	---	5	139	7	151
CdB2	Christiana fine sandy loam, 2 to 5 percent slopes, moderately eroded	22	IIe-41	125	-----	---	5	139	7	151
CdC2	Christiana fine sandy loam, 5 to 10 percent slopes, moderately eroded	23	IIIe-41	130	-----	---	5	139	8	152
CdD2	Christiana fine sandy loam, 10 to 15 percent slopes, moderately eroded	23	IVe-5	131	-----	---	5	139	8	152
CeA	Christiana silt loam, 0 to 2 percent slopes	23	IIs-29	128	-----	---	12	140	7	151
CeB2	Christiana silt loam, 2 to 5 percent slopes, moderately eroded	23	IIe-42	126	-----	---	12	140	7	151
CeC2	Christiana silt loam, 5 to 10 percent slopes, moderately eroded	23	IIIe-42	130	-----	---	12	140	8	152
CeD2	Christiana silt loam, 10 to 25 percent slopes, moderately eroded	23	IVe-3	131	-----	---	12	140	8	152
CfB	Christiana-Urban land complex, 0 to 5 percent slopes	23	-----	---	-----	---	--	---	--	---
CfC	Christiana-Urban land complex, 5 to 15 percent slopes	23	-----	---	-----	---	--	---	--	---
CfE	Christiana-Urban land complex, 15 to 40 percent slopes	23	-----	---	-----	---	--	---	--	---
Cg	Clay pits	24	VIIIs-4	134	-----	---	--	---	--	---
Ch	Codorus silt loam	24	IIw-7	126	5	136	10	140	29	154
Ck	Codorus-Urban land complex	24	-----	---	5	136	--	---	--	---
Cl	Colemantown loam	25	IIIw-7	131	8-2B	136	12	140	1	150
CmA	Collington fine sandy loam, 0 to 2 percent slopes	26	I-5	123	-----	---	9	140	7	151
CmB2	Collington fine sandy loam, 2 to 5 percent slopes, moderately eroded	26	IIe-5	124	-----	---	9	140	7	151
CmC2	Collington fine sandy loam, 5 to 10 percent slopes, moderately eroded	26	IIIe-5	128	-----	---	9	140	8	152
CmC3	Collington fine sandy loam, 5 to 10 percent slopes, severely eroded	26	IVe-5	131	-----	---	9	140	13	153
CmD2	Collington fine sandy loam, 10 to 15 percent slopes, moderately eroded	26	IVe-5	131	-----	---	9	140	8	152
CmD3	Collington fine sandy loam, 10 to 15 percent slopes, severely eroded	26	VIe-2	133	-----	---	--	---	13	153
CmE2	Collington fine sandy loam, 15 to 40 percent slopes, moderately eroded	26	VIe-2	133	-----	---	--	---	9	152
CmE3	Collington fine sandy loam, 15 to 30 percent slopes, severely eroded	26	VIIe-2	133	-----	---	--	---	13	153
CnB2	Collington loamy fine sand, 0 to 5 percent slopes, moderately eroded	27	IIs-4	127	-----	---	3	139	7	151

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
CnC2	Collington loamy fine sand, 5 to 10 percent slopes, moderately eroded---	27	IIIe-33	130	-----	---	3	139	8	152
CnD2	Collington loamy fine sand, 10 to 15 percent slopes, moderately eroded---	27	IVe-5	131	-----	---	3	139	8	152
CoA	Collington silt loam, 0 to 2 percent slopes----------	27	I-4	123	-----	---	13	140	7	151
CoB2	Collington silt loam, 2 to 5 percent slopes, moderately eroded----------	27	IIe-4	124	-----	---	13	140	7	151
CoC3	Collington silt loam, 5 to 10 percent slopes, severely eroded----------	27	IVe-3	131	-----	---	13	140	13	153
CpB	Collington-Urban land complex, 0 to 5 percent slopes----------	27	-----	---	-----	---	--	---	--	---
CpC	Collington-Urban land complex, 5 to 15 percent slopes----------	27	-----	---	-----	---	--	---	--	---
Cr	Comus silt loam----------	28	I-6	123	-----	---	10	140	29	154
CsB2	Croom gravelly loam, 3 to 8 percent slopes, moderately eroded----------	29	IIs-7	127	-----	---	11	140	12	153
CsC2	Croom gravelly loam, 8 to 15 percent slopes, moderately eroded----------	29	IIIe-7	129	-----	---	11	140	16	153
CsC3	Croom gravelly loam, 8 to 15 percent slopes, severely eroded----------	29	IVe-7	132	-----	---	11	140	17	153
CtB2	Croom gravelly sandy loam, 3 to 8 percent slopes, moderately eroded---	29	IIs-9	128	-----	---	9	140	12	153
CtC2	Croom gravelly sandy loam, 8 to 15 percent slopes, moderately eroded---	29	IIIe-9	129	-----	---	9	140	16	153
CtC3	Croom gravelly sandy loam, 8 to 15 percent slopes, severely eroded-----	29	IVe-7	132	-----	---	9	140	17	153
CtD2	Croom gravelly sandy loam, 15 to 25 percent slopes, moderately eroded---	29	IVe-7	132	-----	---	9	140	16	153
CuB	Croom-Urban land complex, 0 to 8 percent slopes----------	29	-----	---	-----	---	--	---	--	---
CuC	Croom-Urban land complex, 8 to 15 percent slopes----------	29	-----	---	-----	---	--	---	--	---
CuE	Croom-Urban land complex, 15 to 35 percent slopes----------	30	-----	---	-----	---	--	---	--	---
DoA	Donlonton fine sandy loam, 0 to 2 percent slopes----------	30	IIw-9	127	6-2B	136	8	139	11	152
DoB2	Donlonton fine sandy loam, 2 to 5 percent slopes, moderately eroded---	31	IIe-36	125	6-2B	136	8	139	11	152
Ek	Elkton silt loam----------	31	IIIw-9	131	8-2B	136	12	140	1	150
ElB	Elkton fine sandy loam, thick surface, 0 to 5 percent slopes----------	31	IIIw-11	131	8-2C	137	8	139	1	150
EmA	Elsinboro loam, 0 to 2 percent slopes----------	32	I-4	123	-----	---	13	140	7	151
EmB2	Elsinboro loam, 2 to 5 percent slopes, moderately eroded----------	32	IIe-4	124	-----	---	13	140	7	151
EnA	Elsinboro sandy loam, 0 to 2 percent slopes----------	32	I-5	123	-----	---	9	140	7	151
EnB2	Elsinboro sandy loam, 2 to 5 percent slopes, moderately eroded----------	32	IIe-5	124	-----	---	9	140	7	151
EnC2	Elsinboro sandy loam, 5 to 10 percent slopes, moderately eroded----------	33	IIIe-5	128	-----	---	9	140	8	152
EuB	Elsinboro-Urban land complex, 0 to 5 percent slopes----------	33	-----	---	-----	---	--	---	--	---
Fl	Fallsington loam----------	34	IIIw-7	131	7-A	136	13	140	1	150
Fs	Fallsington sandy loam----------	34	IIIw-6	130	7-B	136	9	140	1	150
Fu	Fallsington-Urban land complex--------	34	-----	---	7-B	136	--	---	--	---
GaB	Galestown gravelly loamy sand, 0 to 8 percent slopes----------	35	IVs-1	133	-----	---	1	139	5	151

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
GaC	Galestown gravelly loamy sand, 8 to 15 percent slopes	35	VIIs-1	133	-----	---	--	---	5	151
GdB	Galestown loamy sand, 0 to 8 percent slopes	35	IVs-1	133	-----	---	1	139	5	151
GdC	Galestown loamy sand, 8 to 15 percent slopes	35	VIIs-1	---	-----	---	--	---	5	151
GeB	Galestown-Evesboro loamy sands, 0 to 8 percent slopes	35	IVs-1	133	-----	---	1	139	5	151
GeC	Galestown-Evesboro loamy sands, 8 to 15 percent slopes	35	VIIs-1	133	-----	---	--	---	5	151
GmB	Galestown-Urban land complex, 0 to 8 percent slopes	36	-----	---	-----	---	--	---	--	---
GmC	Galestown-Urban land complex, 8 to 15 percent slopes	36	-----	---	-----	---	--	---	--	---
GnC2	Glenelg loam, 8 to 15 percent slopes, moderately eroded	36	IIIe-4	128	-----	---	13	140	30	154
GoB	Glenelg-Urban land complex, 0 to 8 percent slopes	36	-----	---	-----	---	--	---	--	---
Gp	Gravel and borrow pits	37	VIIIs-4	134	-----	---	--	---	--	---
Ha	Hatboro silt loam	37	IIIw-7	131	11-A	137	10	140	22	154
HcC3	Howell clay loam, 6 to 12 percent slopes, severely eroded	38	IVe-3	131	-----	---	14	141	17	153
HcD3	Howell clay loam, 12 to 20 percent slopes, severely eroded	38	VIe-2	133	-----	---	--	---	17	153
HoB2	Howell fine sandy loam, 2 to 6 percent slopes, moderately eroded	38	IIe-28	125	-----	---	5	139	7	151
HoC2	Howell fine sandy loam, 6 to 12 percent slopes, moderately eroded	38	IIIe-28	129	-----	---	5	139	8	152
HwB2	Howell silt loam, 0 to 6 percent slopes, moderately eroded	38	IIe-29	125	-----	---	12	140	7	151
HwC2	Howell silt loam, 6 to 12 percent slopes, moderately eroded	38	IIIe-29	129	-----	---	12	140	8	152
HwD2	Howell silt loam, 12 to 20 percent slopes, moderately eroded	38	IVe-3	131	-----	---	12	140	8	152
HwE2	Howell silt loam, 20 to 35 percent slopes, moderately eroded	39	VIe-2	133	-----	---	--	---	9	152
Hy	Hyde silt loam	39	IIIw-9	131	9-6B	137	--	---	1	150
Ik	Iuka fine sandy loam	40	IIw-7	126	5	136	10A	140	4	151
ImA	Iuka sandy loam, local alluvium, 0 to 2 percent slopes	40	IIw-7	126	5	136	10A	140	4	151
ImB	Iuka sandy loam, local alluvium, 2 to 5 percent slopes	40	IIw-7	126	5	136	10A	140	4	151
In	Iuka silt loam	40	IIw-7	126	5	136	10	140	4	151
IoA	Iuka silt loam, local alluvium, 0 to 2 percent slopes	40	IIw-7	126	5	136	10	140	4	151
IoB	Iuka silt loam, local alluvium, 2 to 5 percent slopes	40	IIw-7	126	5	136	10	140	4	151
Iu	Iuka-Urban land complex	40	-----	---	5	136	--	---	--	---
Ix	Iuka, local alluvium-Urban land complex	40	-----	---	5	136	--	---	--	---
Jo	Johnston silt loam	41	IIIw-7	131	11-A	137	--	---	2	150
Ju	Johnston-Urban land complex	41	-----	---	11-A	137	--	---	--	---
KeA	Keyport fine sandy loam, 0 to 2 percent slopes	42	IIw-9	127	6-2B	136	8	139	11	152
KeB2	Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded	42	IIe-36	125	6-2B	136	8	139	11	152
KeC2	Keyport fine sandy loam, 5 to 10 percent slopes, moderately eroded	42	IIIe-36	130	6-2B	136	8	139	9	152
KpA	Keyport silt loam, 0 to 2 percent slopes	42	IIw-8	126	6-2A	136	12	140	11	152

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
KpB2	Keyport silt loam, 2 to 5 percent slopes, moderately eroded	42	IIe-13	124	6-2A	136	12	140	11	152
KpC2	Keyport silt loam, 5 to 15 percent slopes, moderately eroded	42	IIIe-13	129	6-2A	136	12	140	9	152
KrC3	Keyport silty clay loam, 5 to 10 percent slopes, severely eroded	42	VIe-2	133	6-2A	136	--	---	17	153
KuB	Keyport-Urban land complex, 0 to 10 percent slopes	43	-----	---	6-2A	136	--	---	--	---
Ky	Klej loamy sand	43	IIIw-10	131	4	136	1	139	3	150
LeA	Leonardtown silt loam, 0 to 2 percent slopes	44	IVw-3	132	8-3A	137	--	---	11	152
LeB	Leonardtown silt loam, 2 to 5 percent slopes	44	IVw-3	132	8-3A	137	--	---	11	152
Ma	Made land	44	-----	---	-----	---	--	---	--	---
MfB2	Magnolia fine sandy loam, 2 to 5 percent slopes, moderately eroded	45	IIe-5	124	-----	---	9	140	7	151
MgB2	Magnolia silt loam, 2 to 5 percent slopes, moderately eroded	45	IIe-4	124	-----	---	13	140	7	151
MgC2	Magnolia silt loam, 5 to 10 percent slopes, moderately eroded	45	IIIe-4	128	-----	---	13	140	8	152
MhB2	Manor loam, 3 to 8 percent slopes, moderately eroded	45	IIe-25	125	-----	---	10	140	43	154
MhC2	Manor loam, 8 to 15 percent slopes, moderately eroded	45	IIIe-25	129	-----	---	10	140	43	154
MhD2	Manor loam, 15 to 25 percent slopes, moderately eroded	45	IVe-25	132	-----	---	10	140	44	155
MhF2	Manor loam, 25 to 60 percent slopes, moderately eroded	45	VIIe-3	133	-----	---	--	---	45	155
MkC	Manor-Urban land complex, 8 to 15 percent slopes	46	-----	---	-----	---	--	---	--	---
M1A	Marr fine sandy loam, 0 to 2 percent slopes	46	I-5	123	-----	---	9	140	7	151
M1B2	Marr fine sandy loam, 2 to 6 percent slopes, moderately eroded	46	IIe-5	124	-----	---	9	140	7	151
M1B3	Marr fine sandy loam, 2 to 6 percent slopes, severely eroded	46	IIIe-5	128	-----	---	9	140	13	153
M1C2	Marr fine sandy loam, 6 to 12 percent slopes, moderately eroded	47	IIIe-5	128	-----	---	9	140	8	152
M1C3	Marr fine sandy loam, 6 to 12 percent slopes, severely eroded	47	IVe-5	131	-----	---	9	140	13	153
M1D3	Marr fine sandy loam, 12 to 20 percent slopes, severely eroded	47	VIe-2	133	-----	---	--	---	13	153
M1E	Marr fine sandy loam, 20 to 35 percent slopes	47	VIe-2	133	-----	---	--	---	9	152
MmA	Matapeake fine sandy loam, 0 to 2 percent slopes	47	I-5	123	-----	---	9	140	7	151
MmB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	47	IIe-5	124	-----	---	9	140	7	151
MnA	Matapeake silt loam, 0 to 2 percent slopes	48	I-4	123	-----	---	13	140	7	151
MnB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	48	IIe-4	124	-----	---	13	140	7	151
MnC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	48	IIIe-4	128	-----	---	13	140	8	152
MnC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	48	IVe-3	131	-----	---	13	140	13	153
MnD2	Matapeake silt loam, 10 to 15 percent slopes, moderately eroded	48	IVe-3	131	-----	---	13	140	8	152

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
MoB2	Matapeake silt loam, silty substratum, 2 to 5 percent slopes, moderately eroded	48	IIe-4	124	-----	---	13	140	7	151
MpB	Matapeake-Urban land complex, 0 to 5 percent slopes	48	-----	---	-----	---	--	---	--	---
MpC	Matapeake-Urban land complex, 5 to 15 percent slopes	48	-----	---	-----	---	--	---	--	---
MrA	Matawan fine sandy loam, 0 to 2 percent slopes	49	IIw-10	127	3-A	136	4	139	3	150
MrB2	Matawan fine sandy loam, 2 to 5 percent slopes, moderately eroded	49	IIe-36	125	3-A	136	4	139	3	150
MrC2	Matawan fine sandy loam, 5 to 10 percent slopes, moderately eroded	49	IIIe-36	130	3-A	136	4	139	3	150
MsA	Matawan loamy sand, 0 to 2 percent slopes	49	IIw-10	127	3-B	136	1	139	3	150
MsB	Matawan loamy sand, 2 to 5 percent slopes	49	IIe-36	125	3-B	136	1	139	3	150
MtA	Mattapex fine sandy loam, 0 to 2 percent slopes	50	IIw-5	126	2-A	135	9	140	11	152
MtB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	50	IIe-36	125	2-A	135	9	140	11	152
MuA	Mattapex silt loam, 0 to 2 percent slopes	50	IIw-1	126	2-A	135	13	140	11	152
MuB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	50	IIe-16	125	2-A	135	13	140	11	152
MvB	Mattapex-Urban land complex, 0 to 5 percent slopes	50	-----	---	2-A	135	--	---	--	---
Mw	Mixed alluvial land	50	VIw-1	133	12	137	--	---	2	150
MxC3	Monmouth clay loam, 5 to 10 percent slopes, severely eroded	51	IVe-3	131	-----	---	14	141	13	153
MxD3	Monmouth clay loam, 10 to 30 percent slopes, severely eroded	51	VIe-2	133	-----	---	--	---	13	153
MyA	Monmouth fine sandy loam, 0 to 2 percent slopes	51	I-28	124	-----	---	5	139	7	151
MyB2	Monmouth fine sandy loam, 2 to 5 percent slopes, moderately eroded	51	IIe-28	125	-----	---	5	139	7	151
MyC2	Monmouth fine sandy loam, 5 to 10 percent slopes, moderately eroded	51	IIIe-28	129	-----	---	5	139	8	152
MyD2	Monmouth fine sandy loam, 10 to 15 percent slopes, moderately eroded	51	IVe-5	131	-----	---	5	139	8	152
MzB2	Muirkirk loamy sand, 0 to 5 percent slopes, moderately eroded	52	IIs-5	127	-----	---	2	139	7	151
MzC2	Muirkirk loamy sand, 5 to 10 percent slopes, moderately eroded	52	IIIe-5	128	-----	---	2	139	8	152
OcA	Ochlockonee sandy loam, local alluvium, 0 to 2 percent slopes	53	I-6	123	-----	---	10A	140	4	151
OcB	Ochlockonee sandy loam, local alluvium, 2 to 5 percent slopes	53	IIe-6	124	-----	---	10A	140	4	151
OcC	Ochlockonee sandy loam, local alluvium, 5 to 10 percent slopes	53	IIIe-6	128	-----	---	10A	140	4	151
OhA	Ochlockonee silt loam, local alluvium, 0 to 2 percent slopes	53	I-6	123	-----	---	10	140	4	151
OhB	Ochlockonee silt loam, local alluvium, 2 to 5 percent slopes	53	IIe-6	124	-----	---	10	140	4	151
Ok	Ochlockonee, local alluvium-Urban land complex	53	-----	---	-----	---	--	---	--	---
Ol	Othello fine sandy loam	54	IIIw-6	130	8-1A	136	9	140	10	152
Ot	Othello silt loam	54	IIIw-7	131	8-1A	136	13	140	10	152
Pr	Plummer and Rutlege loamy sands	54	IVw-6	132	9-1	137	1	139	10	152

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
RdA	Rumford loamy sand, 0 to 2 percent slopes	55	IIs-4	127	-----	---	3	139	7	151
RdB2	Rumford loamy sand, 2 to 5 percent slopes, moderately eroded	55	IIs-4	127	-----	---	3	139	7	151
RdC2	Rumford loamy sand, 5 to 10 percent slopes, moderately eroded	55	IIIe-33	130	-----	---	3	139	8	152
RdC3	Rumford loamy sand, 5 to 10 percent slopes, severely eroded	55	IVe-5	131	-----	---	3	139	13	153
RdD2	Rumford loamy sand, 10 to 15 percent slopes, moderately eroded	55	IVe-5	131	-----	---	3	139	8	152
ReB	Rumford-Evesboro loamy sands, 2 to 6 percent slopes	55	IIs-4	127	-----	---	3	139	7	151
ReC	Rumford-Evesboro loamy sands, 6 to 12 percent slopes	56	IIIe-33	130	-----	---	3	139	8	152
ReD	Rumford-Evesboro loamy sands, 12 to 20 percent slopes	56	IVe-5	131	-----	---	3	139	8	152
SaE	Sandy land, steep	56	VIIs-1	133	-----	---	--	---	6	151
ScB	Sandy and clayey land, gently sloping	57	IIIe-41	130	-----	---	5	139	14	153
ScC	Sandy and clayey land, sloping	57	IVe-5	131	-----	---	5	139	14	153
ScD	Sandy and clayey land, moderately steep	57	VIe-2	133	-----	---	--	---	14	153
SfB2	Sassafras gravelly loam, 2 to 5 percent slopes, moderately eroded	58	IIe-4	124	-----	---	13	140	7	151
SfC2	Sassafras gravelly loam, 5 to 10 percent slopes, moderately eroded	58	IIIe-4	128	-----	---	13	140	8	152
SfD2	Sassafras gravelly loam, 10 to 15 percent slopes, moderately eroded	58	IVe-3	131	-----	---	13	140	8	152
SgB2	Sassafras gravelly sandy loam, 2 to 5 percent slopes, moderately eroded	58	IIe-5	124	-----	---	9	140	7	151
SgC2	Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded	58	IIIe-5	128	-----	---	9	140	8	152
SgC3	Sassafras gravelly sandy loam, 5 to 10 percent slopes, severely eroded	58	IVe-5	131	-----	---	9	140	13	153
SgD2	Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded	58	IVe-5	131	-----	---	9	140	8	152
SgD3	Sassafras gravelly sandy loam, 10 to 15 percent slopes, severely eroded	59	VIe-2	133	-----	---	--	---	13	153
SgE	Sassafras gravelly sandy loam, 15 to 30 percent slopes	59	VIe-2	133	-----	---	--	---	9	152
ShA	Sassafras sandy loam, 0 to 2 percent slopes	59	I-5	123	-----	---	9	140	7	151
ShB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	59	IIe-5	124	-----	---	9	140	7	151
ShC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	59	IIIe-5	128	-----	---	9	140	8	152
ShC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	59	IVe-5	131	-----	---	9	140	13	153
SkB	Sassafras-Urban land complex, 0 to 5 percent slopes	59	-----	---	-----	---	--	---	--	---
SkC	Sassafras-Urban land complex, 5 to 15 percent slopes	60	-----	---	-----	---	--	---	--	---
SkE	Sassafras-Urban land complex, 15 to 30 percent slopes	60	-----	---	-----	---	--	---	--	---
SlD	Sassafras-Collington-Aura gravelly sandy loams, 12 to 20 percent slopes	60	IVe-5	131	-----	---	9	140	8	152
SlE	Sassafras-Collington-Aura gravelly sandy loams, 20 to 35 percent slopes	60	VIe-2	133	-----	---	--	---	9	152
SmA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	61	IIIw-6	130	7-B	136	9	140	1	150

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Capability unit		Drainage group		Irrigation group		Woodland suitability group	
			Symbol	Page	Symbol	Page	Number	Page	Number	Page
SmB	Shrewsbury fine sandy loam, 2 to 5 percent slopes	61	IIIw-6	130	7-B	136	9	140	1	150
SnA	Shrewsbury silt loam, 0 to 2 percent slopes	61	IIIw-7	131	7-A	136	13	140	1	150
So	Shrewsbury-Urban land complex	61	-----	---	7-B	136	--	---	--	---
SpB	Silty and clayey land, gently sloping-	61	IIIe-42	130	-----	---	12	140	14	153
SpC	Silty and clayey land, sloping	61	IVe-3	131	-----	---	12	140	14	153
SpE	Silty and clayey land, steep	61	VIIe-2	133	-----	---	--	---	16	153
StB2	Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded	62	IIe-5	124	-----	---	9	140	7	151
StC2	Sunnyside fine sandy loam, 5 to 10 percent slopes, moderately eroded	62	IIIe-5	128	-----	---	9	140	8	152
StD2	Sunnyside fine sandy loam, 10 to 15 percent slopes, moderately eroded	62	IVe-5	131	-----	---	9	140	8	152
StE	Sunnyside fine sandy loam, 15 to 30 percent slopes	62	VIe-2	133	-----	---	--	---	9	152
SuB2	Sunnyside loam, 0 to 5 percent slopes, moderately eroded	62	IIe-4	124	-----	---	13	140	7	151
SuC2	Sunnyside loam, 5 to 10 percent slopes, moderately eroded	62	IIIe-4	128	-----	---	13	140	8	152
SuD2	Sunnyside loam, 10 to 15 percent slopes, moderately eroded	62	IVe-3	131	-----	---	13	140	8	152
SvC3	Sunnyside sandy clay loam, 5 to 10 percent slopes, severely eroded	62	IVe-3	131	-----	---	14	141	13	153
SvD3	Sunnyside sandy clay loam, 10 to 15 percent slopes, severely eroded	62	VIe-2	133	-----	---	--	---	13	153
SwB	Sunnyside-Urban land complex, 0 to 5 percent slopes	62	-----	---	-----	---	--	---	--	---
SwC	Sunnyside-Urban land complex, 5 to 15 percent slopes	63	-----	---	-----	---	--	---	--	---
Sx	Swamp	63	VIIw-1	133	-----	---	--	---	--	---
Tm	Tidal marsh	63	VIIIw-1	134	-----	---	--	---	--	---
WaA	Westphalia fine sandy loam, 0 to 2 percent slopes	64	I-5	123	-----	---	9	140	7	151
WaB2	Westphalia fine sandy loam, 2 to 6 percent slopes, moderately eroded	64	IIe-5	124	-----	---	9	140	7	151
WaB3	Westphalia fine sandy loam, 2 to 6 percent slopes, severely eroded	64	IIIe-5	128	-----	---	9	140	13	153
WaC2	Westphalia fine sandy loam, 6 to 12 percent slopes, moderately eroded	64	IIIe-5	128	-----	---	9	140	8	152
WaC3	Westphalia fine sandy loam, 6 to 12 percent slopes, severely eroded	64	IVe-5	131	-----	---	9	140	13	153
WaD2	Westphalia fine sandy loam, 12 to 20 percent slopes, moderately eroded	64	IVe-5	131	-----	---	9	140	8	152
WaD3	Westphalia fine sandy loam, 12 to 20 percent slopes, severely eroded	65	VIe-2	133	-----	---	--	---	13	153
WbB2	Westphalia very fine sandy loam, 0 to 6 percent slopes, moderately eroded	65	IIe-4	124	-----	---	13	140	7	151
WbC2	Westphalia very fine sandy loam, 6 to 12 percent slopes, moderately eroded	65	IIIe-4	128	-----	---	13	140	8	152
WbD2	Westphalia very fine sandy loam, 12 to 20 percent slopes, moderately eroded	65	IVe-3	131	-----	---	13	140	8	152
WeB2	Westphalia-Evesboro complex, 2 to 6 percent slopes, moderately eroded	65	IIe-5	124	-----	---	9	140	7	151
WeC2	Westphalia-Evesboro complex, 6 to 12 percent slopes, moderately eroded	65	IIIe-5	128	-----	---	9	140	8	152
WeC3	Westphalia-Evesboro complex, 6 to 12 percent slopes, severely eroded	65	IVe-5	131	-----	---	9	140	13	153

Accessibility Statement

This document is not accessible by screen-reader software. 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 (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).