



United States  
Department of  
Agriculture



Natural  
Resources  
Conservation  
Service

In cooperation with  
Tennessee Agricultural  
Experiment Station, Smith  
County Board of  
Commissioners, and  
Tennessee Department  
of Agriculture

# Soil Survey of Smith County, Tennessee





# How to Use This Soil Survey

## General Soil Map

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

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

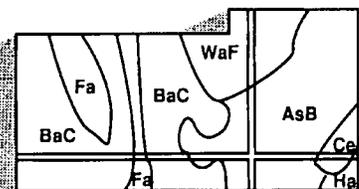
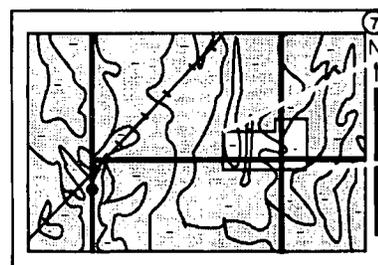
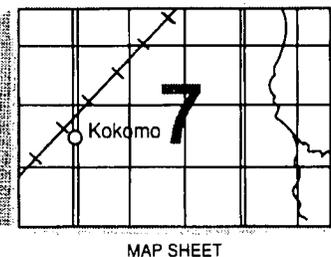
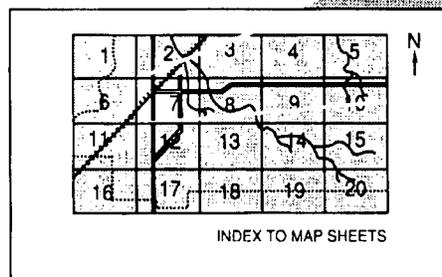
## Detailed Soil Maps

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

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

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

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



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

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

Major fieldwork for this soil survey was completed in 1990. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1990. This survey was made cooperatively by the Natural Resources Conservation Service, the Tennessee Agricultural Experiment Station, the Smith County Board of Commissioners, and the Tennessee Department of Agriculture. The survey is part of the technical assistance furnished to the Smith County Soil Conservation District.

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

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**Cover:** Typical scene in Smith County, Tennessee. Tobacco is an important cash crop in the county. Most of the cleared acreage is used for hay and pasture for beef cattle. Armour soils are in the foreground. Ashwood and Mimosa soils are on hills.

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

# Contents

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Cover .....	1	percent slopes .....	27
How to Use This Soil Survey .....	3	Eg—Egam silt loam, occasionally flooded .....	28
Contents .....	5	HaC2—Hampshire silt loam, 5 to 12 percent slopes, eroded .....	28
Foreword .....	7	HaD2—Hampshire silt loam, 12 to 25 percent slopes, eroded .....	29
General Nature of the County .....	9	HgD—Hawthorne gravelly silt loam, 5 to 20 percent slopes .....	30
Settlement .....	9	HgF—Hawthorne gravelly silt loam, 20 to 60 percent slopes .....	30
Farming .....	10	HkB2—Hicks silt loam, 2 to 5 percent slopes, eroded .....	31
Natural Resources .....	10	HkC2—Hicks silt loam, 5 to 12 percent slopes, eroded .....	31
Physiography and Geology .....	10	HoB2—Holston loam, 2 to 5 percent slopes, eroded .....	32
Climate .....	11	HoC2—Holston loam, 5 to 12 percent slopes, eroded .....	33
How This Survey Was Made .....	11	HoD2—Holston loam, 12 to 25 percent slopes, eroded .....	33
<b>General Soil Map Units</b> .....	13	InC2—Inman flaggy silt loam, 5 to 12 percent slopes, eroded .....	34
1. Hawthorne-Dellrose .....	13	InD2—Inman flaggy silt loam, 12 to 25 percent slopes, eroded .....	35
2. Mimosa-Ashwood-Rock Outcrop .....	13	IsD2—Inman-Sandhill complex, 10 to 20 percent slopes, eroded .....	35
3. Sandhill-Inman-Hicks .....	15	Ln—Lindell silt loam, occasionally flooded .....	36
4. Talbott-Rock Outcrop .....	15	MmC2—Mimosa-Ashwood complex, 5 to 12 percent slopes, eroded .....	37
5. Armour-Arrington .....	16	MrC—Mimosa-Ashwood complex, 5 to 12 percent slopes, rocky .....	38
<b>Detailed Soil Map Units</b> .....	17	MrD2—Mimosa-Ashwood complex, 12 to 30 percent slopes, eroded, rocky .....	39
Ae—Arents .....	18	No—Norene silt loam, rarely flooded .....	39
AmB2—Armour silt loam, 2 to 5 percent slopes, eroded .....	18	Oc—Ocana gravelly silt loam, occasionally flooded .....	40
AmC2—Armour silt loam, 5 to 12 percent slopes, eroded .....	19	PaB—Paden silt loam, 2 to 5 percent slopes .....	41
AmD2—Armour silt loam, 12 to 20 percent slopes, eroded .....	19	SaD2—Sandhill channery silt loam, 12 to 20 percent slopes, eroded .....	41
At—Arrington silt loam, occasionally flooded .....	20	SaE2—Sandhill channery silt loam, 20 to 40 percent slopes, eroded .....	42
AwE—Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes .....	21	SnE2—Sandhill-Inman complex, 20 to 40 percent slopes, eroded .....	42
BaD—Barfield-Rock outcrop complex, 5 to 20 percent slopes .....	21	StB2—Sengtown gravelly silt loam, 2 to 5 percent slopes, eroded .....	43
BcF—Barfield-Ashwood-Rock outcrop complex, 20 to 70 percent slopes .....	23		
BrB2—Bradyville silt loam, 2 to 5 percent slopes, eroded .....	24		
BxC2—Braxton gravelly silt loam, 5 to 12 percent slopes, eroded .....	24		
BxD2—Braxton gravelly silt loam, 12 to 20 percent slopes, eroded .....	25		
DeC—Dellrose gravelly silt loam, 4 to 10 percent slopes .....	25		
DeD—Dellrose gravelly silt loam, 10 to 20 percent slopes .....	26		
DeF—Dellrose gravelly silt loam, 20 to 60 percent slopes .....	27		
DoB—Dowellton silty clay loam, 1 to 4			

StC2—Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded .....	44	Braxton Series .....	76
SyB—Sykes silt loam, 2 to 5 percent slopes .....	45	Dellrose Series .....	77
SyC2—Sykes silt loam, 5 to 12 percent slopes, eroded .....	46	Dowellton Series .....	77
TaB2—Talbott silt loam, 2 to 5 percent slopes, eroded .....	47	Egam Series .....	78
TaC2—Talbott silt loam, 5 to 12 percent slopes, eroded .....	47	Hampshire Series .....	78
TrB—Talbott silt loam, 2 to 5 percent slopes, rocky .....	48	Hawthorne Series .....	79
TrC—Talbott silt loam, 5 to 12 percent slopes, rocky .....	49	Hicks Series .....	80
TxD—Talbott-Rock outcrop complex, 5 to 20 percent slopes .....	50	Holston Series .....	80
<b>Prime Farmland</b> .....	51	Inman Series .....	81
<b>Use and Management of the Soils</b> .....	53	Lindell Series .....	81
Crops and Pasture .....	53	Mimosa Series .....	82
Cropland Management .....	54	Norene Series .....	83
Soil Fertility .....	54	Ocana Series .....	83
Pasture Management .....	55	Paden Series .....	84
Yields per Acre .....	55	Sandhill Series .....	84
Land Capability Classification .....	56	Sengtown Series .....	85
Woodland Management and Productivity .....	56	Sykes Series .....	86
Recreation .....	58	Talbott Series .....	86
Wildlife Habitat .....	59	<b>References</b> .....	89
Engineering .....	63	<b>Glossary</b> .....	91
Building Site Development .....	63	<b>Tables</b> .....	101
Sanitary Facilities .....	64	Table 1.—Temperature and Precipitation .....	102
Construction Materials .....	65	Table 2.—Freeze Dates in Spring and Fall .....	103
Water Management .....	66	Table 3.—Growing Season .....	103
<b>Soil Properties</b> .....	69	Table 4.—Acreage and Proportionate Extent of the Soils .....	104
Engineering Index Properties .....	69	Table 5.—Prime Farmland .....	105
Physical and Chemical Properties .....	70	Table 6.—Land Capability and Yields per Acre of Crops and Pasture .....	106
Soil and Water Features .....	71	Table 7.—Woodland Management and Productivity .....	109
<b>Classification of the Soils</b> .....	73	Table 8.—Recreational Development .....	113
Soil Series and Their Morphology .....	73	Table 9.—Wildlife Habitat .....	117
Armour Series .....	73	Table 10.—Building Site Development .....	120
Arrington Series .....	74	Table 11.—Sanitary Facilities .....	124
Ashwood Series .....	75	Table 12.—Construction Materials .....	129
Barfield Series .....	75	Table 13.—Water Management .....	133
Bradyville Series .....	75	Table 14.—Engineering Index Properties .....	136
		Table 15.—Physical and Chemical Properties of the Soils .....	141
		Table 16.—Soil and Water Features .....	144
		Table 17.—Classification of the Soils .....	147

# Foreword

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

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

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

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

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

James W. Ford  
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# Soil Survey of Smith County, Tennessee

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with  
Tennessee Agricultural Experiment Station, Smith County Board of Commissioners, and Tennessee Department of Agriculture

SMITH COUNTY is in the north-central part of middle Tennessee (fig. 1). It is about 50 miles east of Nashville and 130 miles west of Knoxville. It is bounded on the west by Wilson and Trousdale Counties, on the north by Macon County, on the east by Putnam and Jackson Counties, and on the south by DeKalb County.

Most residents of Smith County are employed by various manufacturers of automotive and machine parts, clothing, and other products. These industries are located near Carthage and Gordonsville. Agriculture is the largest single industry. However, according to the 1987 Census of Agriculture, 683 of 1,123 farm operators had a principal occupation other than farming. Beef cattle and tobacco are the main farm products.

Smith County covers about 208,400 acres, or about 326 square miles. Carthage, the county seat, is located near the center of the county. In 1989, the population of Carthage was 2,672 and that of Smith County was 14,935 (4).

## General Nature of the County

This section provides general information about Smith County. It describes settlement, farming, natural resources, physiography and geology, and climate.

## Settlement

In 1789, the area now called Smith County was settled by William Walton, who also built Walton Road across the Cumberland Plateau (3). In the 1790's, settlers migrated to the area via the Cumberland and Caney Fork Rivers and overland routes. They were attracted by the beautiful landscapes, good water supply, abundant timber and game, and the fertile land along the Cumberland and Caney Fork Rivers.

In 1799, Smith County was the fifth county to be established in middle Tennessee. It was named in honor of David Smith, a colonel in the Revolutionary Army. The original boundaries of Smith County ran from the Kentucky State line in the north to the Georgia State line in the south. As new counties in the middle part of Tennessee were formed and existing counties were expanded, the borders of Smith County were reduced to their present configuration.

During the early 1800's, Smith County was rapidly settled. Agriculture developed early as the area's primary economic activity. Cash incomes from agriculture were derived largely from the sale of livestock, poultry, tobacco, and grains, most of which were consumed by local markets.

In 1857, the Nashville to Chattanooga railroad line was established. The railroad profoundly affected river



Figure 1.—Location of Smith County in Tennessee.

trade near Carthage and increased the commercial importance of the river route. In the 20th century, the important events affecting development of Smith County have been the construction of U.S. Highway 70 in 1925, the Cordell Hull Bridge in 1936, and a series of reservoirs along the Cumberland River during the 1940's, 1950's, and 1960's.

## Farming

According to the 1987 Census of Agriculture, Smith County had 1,123 farms on about 145,507 acres and the average farm covered 130 acres. Most farmland was used for pasture and hay for beef cattle. Corn comprised the largest acreage of cultivated crops, followed by tobacco and soybeans.

## Natural Resources

Soil and water are the two most important natural resources in Smith County. The production of crops, livestock, and timber all depend on these resources. The forests of Smith County hold large stores of hardwood timber. In most of the county water is adequate both for domestic use and for watering livestock. The major sources of water are streams, wells, ponds, and lakes. Cordell Hull and Old Hickory Lakes provide opportunities for recreation and a transportation route for barge traffic. A mining operation near the Caney Fork River produces zinc ore and, as a by-product, crushed limestone.

## Physiography and Geology

Most of Smith County is in the outer part of the Nashville Basin. A small area along the western edge of the county is in the inner part of the Nashville Basin. A few areas of the Highland Rim extend into the

northern and eastern parts of Smith County. The Nashville Basin is underlain by rocks of Ordovician age. The Highland Rim is underlain by rocks of Mississippian age.

The outer part of the Nashville Basin is underlain by the Leipers-Catheys, Bigby-Cannon, and Hermitage Formations. The Leipers-Catheys and Bigby-Cannon Formations consist of phosphatic limestone. Landscapes in areas underlain by these two formations consist of highly dissected ridges and hills with long, steep and very steep side slopes drained by streams in long, narrow valleys. Outcrops and exposures of hard limestone bedrock are common.

The Hermitage Formation is at lower elevations in the outer part of the Nashville Basin. In Smith County it consists of interbedded siltstone, limestone, and shale. Most exposures of the Hermitage Formation are in the southern and western areas of the county. Landscapes in areas underlain by this formation consist of hills and ridges that have moderately steep or steep side slopes and gently sloping or sloping ridgetops. Some landscapes have sinkholes resulting from the dissolution of limestone in the underlying Carters Formation. The boundary between the inner and outer parts of the Nashville Basin is at the contact between the Carters and Hermitage Formations.

The inner part of the Nashville Basin in Smith County is underlain by the Carters and Lebanon Formations, which consist of nonphosphatic limestone. Landscapes in this area are hilly to undulating. They have common outcrops and exposures of hard limestone bedrock and some sinkholes resulting from dissolution cavities.

Some remnants of the Highland Rim extend into Smith County on the tops and upper slopes of ridges in the northern and eastern parts of the county. Ridgetops are gently sloping to moderately steep. The side slopes of ridges are steep or very steep. The Highland Rim in Smith County is underlain by the Fort Payne Formation, which consists of very cherty limestone and siltstone.

The Cumberland River dissects the county from east to west. The Caney Fork River runs from the southeastern corner of the county to Carthage, where it joins the Cumberland River. The Cumberland River is impounded by the Cordell Hull Dam at a point 4 miles above the confluence of the Cumberland and Caney Fork Rivers. The dam forms Cordell Hull Lake, which extends into Jackson County. Below the Cordell Hull Dam, the Cumberland is impounded to form Old Hickory Lake.

The elevation in Smith County ranges from 1,220 to

450 feet above mean sea level (m.s.l.). The normal pool level of Old Hickory Lake is 450 feet above m.s.l.

## Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Carthage in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring and table 3 provides data on length of the growing season at Cordell Hull in the period 1973 to 1980.

In winter, the average temperature in the county is 38 degrees F and the average daily minimum temperature is 26 degrees. The lowest temperature on record, which occurred on January 24, 1968, is -20 degrees. In summer, the average temperature is 76 degrees and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred on July 17, 1980, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 52 inches. Of this, about 26 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 6.51 inches on September 14, 1979. Thunderstorms occur on about 54 days each year, and most occur in summer. Severe local storms, including tornadoes, occasionally occur in the county or in nearby areas. They are of short duration. The damage caused by these storms varies and is spotty in extent.

The average seasonal snowfall is about 9 inches. The greatest snow depth at any one time during the period of record was 7 inches. On the average, 4 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south.

Average windspeed is highest, 10 miles per hour, in spring.

## How This Survey Was Made

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey

area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit

local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

# General Soil Map Units

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

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

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

## Soil Descriptions

### 1. Hawthorne-Dellrose

*Sloping to very steep, moderately deep and very deep, gravelly soils that are loamy throughout; formed in material weathered from siltstone and cherty limestone; on uplands*

This map unit has prominent relief. It consists mainly of highly dissected hills and ridges that have long, steep and very steep side slopes. The sloping or moderately steep ridgetops are long, narrow, and winding. Slopes range from 4 to 60 percent.

Most of this unit is used as hardwood forest, which covers the steep and very steep side slopes. Many of the narrow ridgetops and the narrow flood plains and drainageways in the valleys have been cleared and are used for pasture or row crops. Most roads, houses, and farm buildings are also on the narrow ridgetops and in the narrow valleys.

This map unit makes up about 20 percent of the survey area. It is about 38 percent Hawthorne soils, 37

percent Dellrose soils, and 25 percent soils of minor extent.

Of minor extent in this map unit are Ashwood, Barfield, Mimosa, and Sengtown soils on uplands and Ocana soils on narrow flood plains.

The moderately steep to very steep Hawthorne soils are on convex side slopes. They are moderately deep and well drained. They are loamy throughout and are underlain by interbedded siltstone, limestone, and chert.

The sloping to very steep Dellrose soils are on concave side slopes and foot slopes, commonly below Hawthorne soils. Dellrose soils are very deep and well drained. They are loamy throughout. These soils formed in colluvium derived from siltstone and cherty limestone.

Most areas of this unit are not suited to row crops and are poorly suited to pasture. The steep and very steep slopes, limited available water capacity, and rock fragments are the main limitations.

This unit is moderately suited to woodland use, and potential productivity is moderate. Tree growth is limited by depth to rock and a low available water capacity in the Hawthorne soils. The steep and very steep slopes restrict use of logging equipment and make replanting and managing woodland difficult. Erosion is a hazard on logging roads and skid trails.

Most areas of this unit are not suited to residential or commercial development. The steep and very steep slopes are severe limitations.

### 2. Mimosa-Ashwood-Rock Outcrop

*Sloping to steep, deep and moderately deep soils that have a clayey subsoil, and limestone outcrops; formed in material weathered from limestone; on uplands*

This map unit consists of discontinuous ridges and isolated hills that have long, moderately steep and steep hillsides and rounded tops (fig. 2). This map unit is more weathered and is lower on the landscape than general soil map unit 1. Between the ridges and the hills, in long, narrow valleys, are strips of colluvium on foot slopes and alluvium in drainageways. Most areas



Figure 2.—The Mimosa-Ashwood-Rock outcrop general soil map unit is in the background. The Armour-Arrington general soil map unit is in the foreground.

have limestone outcrops. Slopes range from 5 to 45 percent.

This map unit makes up about 52 percent of the survey area. It is about 27 percent Mimosa soils, 26 percent Ashwood soils, and 9 percent Rock outcrop, and 38 percent soils of minor extent.

Of minor extent in this map unit are Arents, Barfield, Dellrose, and Hawthorne soils on uplands. Also of minor extent are Armour soils on foot slopes and terraces and Ocana soils in drainageways.

Most areas of this unit are used as hardwood forest. Some areas are cleared and are used for pasture. A few areas on hilltops, benches, and foot slopes and in drainageways are used for tobacco, corn, or vegetable gardens. Many areas were cleared in the past and were used for pasture or row crops. These areas were difficult to manage and had low productivity, so they have reverted to brushland and woodland. Most roads, farmsteads, and urban development are in the valleys.

The sloping to steep Mimosa soils are on side slopes and hilltops. These soils are deep and well drained. They have a clayey subsoil. They are underlain by limestone bedrock at a depth of 40 to 60 inches.

The sloping to steep Ashwood soils are on side slopes and hilltops. They are moderately deep and well drained. They have a clayey subsoil. They are underlain by limestone bedrock at a depth of 20 to 40 inches.

Limestone bedrock crops out throughout this unit. The outcrops range from flat exposures that are level with the surface to massive, rounded boulders and ledges that extend from a few inches to several feet above the surface.

This unit is not suited to row crops and is poorly suited to pasture. Steep slopes, rock outcrops, and limited available water capacity are the main limitations.

This unit is moderately suited to woodland use, and potential productivity is moderate. Tree growth is reduced by the limited available water capacity. Rock outcrops and dominantly steep slopes restrict the use of logging equipment and limit replanting and woodland management. Erosion is a hazard on logging roads and skid trails.

Most of this unit is poorly suited to residential or commercial development. Depth to bedrock, dominantly steep slopes, and moderately slow or slow permeability in the clayey subsoil are severe limitations.

### 3. Sandhill-Inman-Hicks

*Gently sloping to steep, deep and moderately deep soils that have a loamy or clayey subsoil; formed in material weathered from interbedded limestone, siltstone, and shale; on uplands*

This unit consists of hills and ridges of lower relief than those in general soil map units 1 and 2. Some areas of this unit are on the lower part of ridges and hills of general soil map unit 2. Most areas are adjacent to drainageways and flood plains. Slopes range from 2 to 40 percent.

Hardwood forest and pasture make up about equal parts of this unit. The steep side slopes are used mostly as woodland. The hilltops and less steep side slopes are used for pasture. Some ridgetops and foot slopes are used for row crops. Most roads, houses, and other structures are on ridgetops or are adjacent to drainageways.

This unit makes up about 10 percent of the county. It is about 24 percent Sandhill soils, 23 percent Inman soils, 23 percent Hicks soils, and 30 percent soils of minor extent.

Of minor extent in this map unit are Hampshire and Talbott soils on uplands, Armour and Sykes soils on foot slopes and terraces, and Arrington soils on flood plains.

The moderately steep or steep Sandhill soils are on side slopes of ridges and hills. These soils are deep and well drained. They are loamy and have siltstone fragments throughout. They are underlain by interbedded siltstone and limestone bedrock at a depth of 40 to 60 inches.

The sloping to steep Inman soils are on the side slopes of ridges and on hills. They are moderately deep and well drained. They have a clayey subsoil. The surface layer and the subsoil contain flagstones of limestone. These soils have interbedded limestone and shale bedrock at a depth of 20 to 40 inches.

The gently sloping or sloping Hicks soils are on ridgetops. These soils are deep and well drained. They

are loamy throughout. In the lower part of the subsoil, they contain siltstone fragments. These soils are underlain by interbedded siltstone and limestone at a depth of 40 to 60 inches.

This unit has a few outcrops of limestone bedrock and some sinkholes. The outcrops and sinkholes are mostly on Inman soils.

Most areas of this unit are poorly suited to row crops and moderately suited or poorly suited to pasture. Slope, the erosion hazard, and limited available water capacity are limitations for agriculture.

This unit is moderately suited to woodland use. Tree growth is limited by depth to bedrock and limited available water capacity. Managing woodland is difficult because of steep slopes.

This unit is poorly suited to residential or commercial development. Slope, depth to bedrock, and shrink-swell potential are severe limitations.

### 4. Talbott-Rock Outcrop

*Gently sloping to moderately steep, moderately deep soils that have a clayey subsoil, and limestone outcrops; formed in material weathered from limestone; on uplands*

This unit consists of undulating to hilly landscapes and, in some areas, foot slopes below general soil map unit 3. It has numerous sinkholes. In many places an indistinct drainage pattern consisting of sinking streams and blind valleys has developed. Slopes range from 2 to 20 percent.

Most areas of this unit are used as woodland or pasture. The areas that are shallower over bedrock and that have more rock outcrops are used mostly as woodland. Eastern redcedar, hickory, and oak are the most common trees on this unit. Many areas previously used as pasture have reverted to brush. The areas that are less sloping or that have fewer rock outcrops are generally used as pasture or as sites for houses and other buildings.

This unit makes up about 6 percent of the county. It is about 58 percent Talbott soils, 7 percent Rock outcrop, and 35 percent soils of minor extent.

Of minor extent in this map unit are Barfield, Bradyville, Inman, and Sandhill soils on uplands and Egam and Lindell soils in drainageways.

The gently sloping to moderately steep Talbott soils are on undulating to rolling uplands. They are moderately deep and well drained. They have a clayey subsoil. Depth to limestone bedrock is 20 to 40 inches.

Outcrops of limestone bedrock are throughout this unit. They range from nearly level with the

surface to massive, rounded boulders and ledges that extend from a few inches to several feet above the surface.

Most areas of this unit are poorly suited to row crops and moderately suited to pasture. Rock outcrops reduce the area available for production and interfere with tillage and management operations. Low or moderate available water capacity limits yields. Erosion is a hazard on cultivated fields or overgrazed pastures.

This map unit is moderately suited to woodland use. Rock outcrops and low or moderate available water capacity restrict tree growth and interfere with management operations.

This unit is poorly suited to residential or commercial development. Depth to bedrock, rock outcrops, moderately slow permeability, low strength, moderate shrink-swell potential, and slope are difficult limitations to overcome.

## 5. Armour-Arrington

*Nearly level to moderately steep, very deep soils that are loamy throughout; formed in alluvium; on stream terraces and flood plains*

Most of this map unit is on stream terraces and flood plains along the Cumberland and Caney Fork Rivers. The flood plains are nearly level. Some sloping areas are on riverbanks and along the small streams that cut through the flood plains and drain into the rivers. The low terraces adjacent to flood plains are undulating to rolling. The higher terraces are more dissected than the low terraces. Slopes range from 0 to 20 percent.

Most of this unit is cleared and is used for pasture, hay, or row crops. Most of the largest areas of row crops and hay are in this map unit. Some areas have been developed and are used for houses or for commercial and industrial sites. Most development has

been on terraces where the soils are not subject to flooding.

This map unit makes up about 12 percent of the survey area. It is about 40 percent Armour soils, 25 percent Arrington soils, and about 35 percent soils of minor extent.

Of minor extent in this map unit are Holston and Paden soils on stream terraces and Egam and Lindell soils on flood plains.

Arrington soils are on flood plains. They generally are nearly level, but a few areas on or adjacent to streambanks are sloping to moderately steep. These soils are very deep and well drained. They are loamy throughout. They formed in recent alluvium more than 60 inches thick. Arrington soils are subject to occasional flooding.

Armour soils are on stream terraces and are gently sloping to moderately steep. These soils are very deep and well drained. They are loamy throughout. They formed in old alluvium more than 60 inches thick over bedrock. Some areas have sinkholes resulting from the dissolution of the underlying limestone.

Most areas of this unit are well suited or moderately suited to row crops, depending on steepness of slope. Erosion is a hazard if row crops are grown, especially in the steeper areas. Hence, the appropriate erosion-control measures are needed.

This unit is well suited to pasture. Most areas do not have any serious limitations. Under good management, the commonly grown forage crops can produce high yields.

This unit is well suited to woodland use. The only woodland management concern is controlling plant competition in new stands.

The soils on flood plains are subject to flooding and are not suitable for residential or commercial development. The soils on stream terraces are moderately suited to these uses, but they are limited by low strength and slope.

## Detailed Soil Map Units

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

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

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in

the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Armour silt loam, 2 to 5 percent slopes, eroded, is a phase of the Armour series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. An example of a miscellaneous area is Rock outcrop, which is a component of the Talbott-Rock outcrop complex, 5 to 20 percent slopes.

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

### **Ae—Arents**

These soils were formed by major excavation projects at several sites in Smith County. The largest sites are the Tennessee Valley Authority Hartsville Nuclear Plant at the Trousdale County line and areas near the Jersey Minere zinc mine. Other sites include large construction projects, where substantial excavation and soil disturbance have occurred. Most of these sites are underlain by limestone or interbedded limestone, siltstone, and shale. During excavation, the original soil and the underlying bedrock were disturbed or removed to varying degrees. The resulting soils consist of a mixture of disturbed soils, rock fragments, and, in some areas, exposed bedrock. The proportion of rock fragments, exposed bedrock, and soil material is highly variable. Slope is variable; some areas have been leveled and smoothed, but other areas contain steep piles of raw, excavated earth material and rocks.

In some areas these soils have been leveled, prepared for a seedbed, and seeded to grass. In some areas they have been abandoned and support weedy or only sparse vegetation. In other areas they are used as commercial or industrial sites or are paved. An onsite assessment is needed to determine the suitability of individual sites for various uses. In most areas reclamation or adaptation is needed to make these soils suitable for a specific use. Individual areas range from 5 to 635 acres.

These soils are not assigned to a land capability subclass.

### **AmB2—Armour silt loam, 2 to 5 percent slopes, eroded**

This is a very deep, well drained soil on stream terraces and foot slopes. It is on broad, gently sloping terraces near the Cumberland River and other major streams. Individual areas of this soil range from 5 to 160 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark brown silt loam

*Subsoil:*

6 to 10 inches, strong brown silt loam

10 to 33 inches, strong brown and brown silty clay loam

33 to 72 inches, yellowish red silty clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping, at slightly lower elevations, are some small areas of moderately well drained Paden soils, which have a fragipan. Small areas of Holston soils, which have a higher sand content than that of Armour soils, are included in some map units. Also included are some small areas of soils that are more than 15 percent gravel in one or more layers, areas of soils that have a clayey layer in the subsoil, and areas of soils that are less than 60 inches deep to bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

Most areas of this soil are used for row crops, pasture, or hay. A few small areas are used as woodland.

This soil is well suited to row crops. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to hay and pasture. It does not have any serious limitations. If limed and fertilized, it will produce good yields of forage.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to most residential or commercial development. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade will help to overcome low strength.

This soil is in land capability subclass IIe.

### **AmC2—Armour silt loam, 5 to 12 percent slopes, eroded**

This is a very deep, well drained soil on stream terraces and foot slopes. It is on wide terraces along the Cumberland River and other major streams and on side slopes of ridges on the higher, more dissected terraces. It is in long, narrow areas along drainageways and on foot slopes. Individual areas of this soil range from 5 to 250 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark brown silt loam

*Subsoil:*

6 to 10 inches, strong brown silt loam

10 to 33 inches, strong brown and brown silty clay loam

33 to 72 inches, yellowish red silty clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping, at slightly lower elevations, are some small areas of moderately well drained Paden soils, which have a fragipan. Also included, in some map units, are small areas of Holston soils, which have a sand content higher than that in this Armour soil. Also included are some small areas of soils that are more than 15 percent gravel in one or more layers, areas of soils that have a clayey layer in the subsoil, and areas of soils that are less than 60 inches deep to bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for row crops or forage. A few areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay. On pasture, maintaining soil fertility and soil pH, controlling weeds, and preventing overgrazing help to sustain productivity and to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to most residential or commercial development. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade helps to overcome low strength.

This soil is in land capability subclass IIIe.

### **AmD2—Armour silt loam, 12 to 20 percent slopes, eroded**

This is a very deep, well drained soil on side slopes in dissected areas of old terraces along major streams. Some areas are on foot slopes. Individual areas of this soil are long and narrow and range from 5 to 90 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark brown silt loam

*Subsoil:*

6 to 10 inches, strong brown silt loam

10 to 33 inches, strong brown and brown silty clay loam

33 to 72 inches, yellowish red silty clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some small areas of soils that have a clayey subsoil or that have

soft siltstone or limestone bedrock at a depth of less than 60 inches. Also included, in some map units, are small areas of Holston soils, which have a higher sand content than that in the Armour soil. Also included are some small areas of soils that are more than 15 percent gravel in one or more layers.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops because of slope and the erosion hazard.

This soil is moderately suited to pasture and hay. Erosion is a hazard unless a good cover of forage plants is maintained. Good management practices will insure adequate cover and will maintain a high level of forage production. Applicable management practices include fertilizing and liming, maintaining an adequate legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

Slope is a severe limitation for residential or commercial development. Grading or excavating may be required. Overcoming the slope becomes increasingly difficult and expensive in the steeper areas of this soil. On construction sites, conservation measures are needed during construction to control erosion. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade helps to overcome low strength.

This soil is in land capability subclass IVe.

### **At—Arrington silt loam, occasionally flooded**

This is a very deep, well drained soil on flood plains throughout the county. Slopes are dominantly 0 to 3

percent. Individual areas of this soil are long and narrow. The areas along the Cumberland River are generally larger and broader than those along smaller streams. Individual areas of this soil range from 5 to 150 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, dark brown silt loam

9 to 27 inches, very dark grayish brown silt loam

*Subsoil:*

27 to 40 inches, dark yellowish brown silt loam

40 to 60 inches, dark yellowish brown silty clay loam

Included with this soil in mapping, in the lower areas of the map unit, are small areas of moderately well drained Lindell soils. Ocana soils are included in some areas below the gravelly Hawthorne and Dellrose soils. Also included, mostly along the smaller creeks and drainageways, are some areas of soils that are shallower than 60 inches to bedrock. Also included, adjacent to the Cumberland River, are some areas of soils that have a loam or sandy loam surface layer and a sandy loam subsoil and substratum. Generally, in these areas the sand content is highest next to the river channel and decreases with distance from the channel.

Many areas along the Cumberland River are dissected by deep, narrow channels that have slopes ranging to 15 percent.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Slightly acid to slightly alkaline

*Flooding frequency:* Occasional

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 4 feet

In most areas this soil has been cleared and is used for row crops, pasture, or hay. It is well suited to these uses. Under good management it will produce high yields. Flooding, which occurs most often in spring, is a hazard to crops planted early in spring. Excessive erosion is a hazard if row crops are grown in areas that have short slopes of 5 percent or more.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is not suited to residential or commercial development because of flooding.

This soil is in land capability subclass IIw.

### **AwE—Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes**

This map unit consists of Ashwood and Mimosa soils and Rock outcrop in areas so intricately mixed or so small in size that they could not be separated in mapping. The soils formed in limestone residuum on hills and ridges. The map unit is 25 to 35 percent Ashwood soil, 20 to 35 percent Mimosa soil, and 10 to 20 percent Rock outcrop. Individual areas of this unit are irregular in shape and range from 5 to 2,100 acres.

The typical sequence, depth, and composition of the layers of this Ashwood soil are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 13 inches, dark brown silty clay loam  
13 to 23 inches, dark yellowish brown clay  
23 to 31 inches, yellowish brown clay

*Bedrock:*

31 inches, hard limestone

The typical sequence, depth, and composition of the layers of this Mimosa soil are—

*Surface layer:*

0 to 6 inches, brown silt loam

*Subsoil:*

6 to 55 inches, yellowish brown clay

*Bedrock:*

55 inches, hard limestone

Rock outcrop consists of limestone bedrock that extends a few inches to 3 feet or more above the surface of the soil. In many places rock outcrops are concentrated in bands on the contour around side slopes.

Included in mapping, in concave positions, are areas of the very deep, loamy Dellrose soils. Also included are areas of soils that are less than 8 inches deep over bedrock. Included soils make up 10 to 20 percent of the map unit.

Important soil properties and features of this Ashwood soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low or moderate

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Important properties and features of this Mimosa soil are—

*Permeability:* Moderately slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock ranges from moderately acid to slightly alkaline.

*Flood hazard:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this map unit are used as woodland. Some areas are used as pasture (fig. 3). Most areas were cleared, proved to be hard to manage, had low forage yields, and have since reverted to woodland.

This unit is not suited to row crops. It is poorly suited to pasture. Steep slopes, rock outcrops, and the limited available water capacity severely limit this unit for agricultural use. Pasture is difficult to establish and maintain, and during dry periods forage production is low. The erosion hazard is very severe if vegetation is removed.

This unit is moderately suited or poorly suited to woodland use. Trees suitable for planting or feasible to manage for production include black locust, loblolly pine, and eastern redcedar. The limited available water capacity, slope, and rock outcrops restrict tree growth and interfere with woodland management. Equipment use is limited by steepness of slope. Erosion is a hazard on logging roads and skid trails. Seedling mortality is a problem in areas of shallow or very shallow soils that have a surface layer of silty clay loam or silty clay.

This unit is not suited to residential or commercial development. Slope, rock outcrops, depth to bedrock, high shrink-swell potential, low strength, and moderately slow permeability are severe limitations for most urban uses.

This map unit is in land capability subclass VIIc.

### **BaD—Barfield-Rock outcrop complex, 5 to 20 percent slopes**

This unit consists of a Barfield soil and Rock outcrop in areas so intricately intermixed they could not be separated in mapping. The proportion of the Barfield soil and areas of Rock outcrop varies from

area to area. The Barfield soil makes up about 35 to 60 percent of the unit, and Rock outcrop makes up about 5 to 25 percent. This unit is on hilltops on steep and very steep uplands and on hilltops and side slopes in rolling to hilly uplands. Individual areas of the unit range from 5 to 200 acres.

The typical sequence, depth, and composition of the layers of this Barfield soil are—

*Surface layer:*

0 to 4 inches, very dark grayish brown silty clay loam

*Subsoil:*

4 to 11 inches, dark brown silty clay

11 to 14 inches, brown flaggy clay

*Bedrock:*

14 inches, hard limestone

Rock outcrop consists of level-bedded limestone bedrock that extends a few inches to 3 or 4 feet above the surface. The outcrops that are level with or extend only a few inches above the surface are in layers only

a few inches thick. The outcrops that extend higher above the surface are more massive.

Included in mapping are small areas of Ashwood, Mimosa, and Talbott soils. All these soils have a clayey subsoil and are more than 20 inches deep over bedrock. Also included are some areas of soils less than 8 inches deep over bedrock. Included soils make up 15 to 50 percent of each mapped area.

Important soil properties and features of this Barfield soil are—

*Permeability:* Moderately slow

*Available water capacity:* Very low or low

*Soil reaction:* Slightly acid to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Shallow

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Almost all areas of this map unit are used as woodland. A few areas are used for pasture. This map unit is not suited to row crops or hay and is poorly



**Figure 3.—**Most areas of the Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes, are used as woodland. Some areas are used as unimproved pasture, but forage production is low and pasture management is difficult.

suited to pasture. Rock outcrops and low or very low available water capacity severely limit agricultural uses.

This unit is poorly suited to timber production. Rock outcrops, depth to bedrock, and low or very low available water capacity are severe limitations for tree growth and woodland management. Eastern redcedar and pignut hickory are the most common trees on this unit. Trees are subject to windthrow because much of the unit is shallow to bedrock. Seedling survival is a problem because of a moisture deficiency.

This map unit is not suited to residential or commercial development. Rock outcrops, shallow depth to bedrock, and high shrink-swell potential are all difficult limiting factors to overcome for these uses.

This map unit is in land capability subclass VI.

### **BcF—Barfield-Ashwood-Rock outcrop complex, 20 to 70 percent slopes**

This unit consists of Barfield and Ashwood soils and Rock outcrop in areas so intricately intermixed that they could not be separated in mapping. The proportion of each soil varies from one area to another. The Barfield soil makes up 30 to 55 percent of the map unit, the Ashwood soil makes up 10 to 30 percent, and areas of Rock outcrop make up 10 to 30 percent. This unit is on side slopes of hills and ridges and on bluffs along the larger streams. Areas of this unit that have the steepest slopes are on hillsides below units of Hawthorne soils and on bluffs along streams. Individual areas of this unit range from 10 to 450 acres.

The typical sequence, depth, and composition of the layers of this Barfield soil are—

*Surface layer:*

0 to 4 inches, very dark grayish brown silty clay loam

*Subsoil:*

4 to 11 inches, dark brown silty clay

11 to 14 inches, brown flaggy clay

*Bedrock:*

14 inches, hard limestone

The typical sequence, depth, and composition of the layers of this Ashwood soil are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 13 inches, dark brown silty clay loam

13 to 23 inches, dark yellowish brown clay

23 to 31 inches, yellowish brown clay

*Bedrock:*

31 inches, hard limestone

Rock outcrop consists of level-bedded limestone bedrock that extends a few inches to 3 or 4 feet above the surface. The rock outcrops that are level with the surface or extend only a few inches above the surface are in layers only a few inches thick. The rock outcrops that extend higher above the surface are more massive. In many places bands of rock outcrops are on the contour with the slope.

Included in mapping are small areas of Mimosa soils. Also included are some areas of soils that are less than 8 inches deep over bedrock. Included soils make up 5 to 25 percent of the map unit.

Important soil properties and features of this Barfield soil are—

*Permeability:* Moderately slow

*Available water capacity:* Very low or low

*Soil reaction:* Slightly acid to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Shallow

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Important properties and features of this Ashwood soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low or moderate

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

In almost all areas this map unit is used as woodland. It is not suited to row crops or pasture. Steep or very steep slopes, rock outcrops, and the limited available water capacity are severe limitations for agricultural use.

This unit is poorly suited to timber production. Steep and very steep slopes, rock outcrops, and the limited available water capacity are severe limitations to tree growth and woodland management. Eastern redcedar and black locust are suitable trees to plant or to manage on this unit. Trees are subject to windthrow because much of the unit is shallow to bedrock.

This map unit is not suited to residential or commercial development. Rock outcrops, steep and very steep slopes, shallow depth to bedrock, and the

high shrink-swell potential are all limiting factors for these uses.

This map unit is in land capability subclass VIIc.

### **BrB2—Bradyville silt loam, 2 to 5 percent slopes, eroded**

This is a deep, well drained soil on uplands in the inner part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 60 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark brown silt loam

*Subsoil:*

6 to 22 inches, yellowish red silty clay loam

22 to 30 inches, yellowish red clay

30 to 40 inches, red clay

40 to 48 inches, yellowish red clay

*Bedrock:*

48 inches, hard limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of Talbot soils and some areas where the subsoil is dominantly silty clay loam instead of clay. Also included are some areas that have a few limestone outcrops.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but the layer just above bedrock ranges to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most of the acreage is used for pasture, hay, or row crops. A few areas are used as woodland.

This soil is well suited to row crops. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to hay and pasture. It does not have any serious limitations. If limed and fertilized, it will produce good yields of forages.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, northern red oak, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade helps to overcome low strength. Moderate shrink-swell potential is a limitation for dwellings and small commercial buildings. Placing extra reinforcements in footings and foundations or backfilling with sandy material can help to overcome moderate shrink-swell potential.

This soil is in land capability subclass IIc.

### **BxC2—Braxton gravelly silt loam, 5 to 12 percent slopes, eroded**

This is a very deep, well drained soil on uplands near the Cumberland and Caney Fork Rivers. Individual areas of this soil are irregular in shape and range from 5 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark yellowish brown gravelly silt loam

*Subsoil:*

6 to 60 inches, strong brown clay

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of Hampshire and Mimosa soils, which are 40 to 60 inches deep over bedrock. Also included are a few areas where the subsoil is loamy instead of clayey.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. A few areas are used for row crops.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay. Most forage crops are well suited. On pasture, fertilizing and liming at levels recommended by soil tests and preventing overgrazing will sustain productivity and will help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade helps to overcome low strength. The clayey subsoil is difficult to manage in sanitary landfills. Moderate shrink-swell potential is a limitation for dwellings and small commercial buildings. Placing extra reinforcements in footings and foundations or backfilling with sandy material can overcome moderate shrink-swell potential.

This soil is in land capability subclass IIIe.

### **BxD2—Braxton gravelly silt loam, 12 to 20 percent slopes, eroded**

This is a very deep, well drained soil on uplands near the Cumberland and Caney Fork Rivers. Individual areas of this soil are irregular in shape and range from 5 to 60 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, dark yellowish brown gravelly silt loam

*Subsoil:*

6 to 60 inches, strong brown clay

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of Hampshire and Mimosa soils, which are 40 to 60

inches deep over bedrock. Also included are a few areas where the subsoil is loamy.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Moderate

*Depth to water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops because of slope and the erosion hazard. It is moderately suited to pasture and hay. On pasture, erosion can be a hazard unless a good cover of forage plants is maintained. Good management practices will insure adequate cover and will maintain a high level of forage production. Applicable management practices include fertilizing and liming, maintaining a good legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is moderately suited to residential or commercial development. Grading or excavating is required for many uses because of the moderately steep slopes. On construction sites, conservation measures are needed during construction to control erosion. The clayey subsoil is difficult to manage in sanitary landfills. Low strength is a severe limitation for local roads and streets. Adding coarse gravel to the subgrade helps to overcome low strength. Moderate shrink-swell potential is a limitation for dwellings and small commercial buildings. This limitation can be overcome by placing extra reinforcements in footings and foundations or by backfilling with sandy material.

This soil is in land capability subclass IVe.

### **DeC—Dellrose gravelly silt loam, 4 to 10 percent slopes**

This is a very deep, well drained soil on foot slopes

in the outer part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 175 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, dark brown gravelly silt loam

*Subsoil:*

9 to 18 inches, brown gravelly silt loam

18 to 68 inches, brown and strong brown gravelly silty clay loam

Included with this soil in mapping are small areas of Armour soils, which have few or no rock fragments, and small areas of Mimosa soils, which have a clayey subsoil.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid, but the lower part of the subsoil is moderate where clayey

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture, hay, or row crops. A few areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay. On pasture, fertilizing and liming at the proper levels and preventing overgrazing will sustain productivity and will help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to residential or commercial development. Seepage is a severe limitation for sewage lagoons and area sanitary landfills. The gravel in this soil is a moderate limitation for lawns and landscaping and for use as cover material.

This soil is in land capability subclass IIIe.

### **DeD—Dellrose gravelly silt loam, 10 to 20 percent slopes**

This is a deep, well drained soil on side slopes and benches in the outer part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 60 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, dark brown gravelly silt loam

*Subsoil:*

9 to 18 inches, brown gravelly silt loam

18 to 68 inches, brown and strong brown gravelly silty clay loam

Included with this soil in mapping are small areas of Armour soils, which have little or no gravel, and small areas of Mimosa soils, which have a clayey subsoil.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid, but the lower part of the subsoil, where clayey, is moderate

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops because of slope and the erosion hazard. It is moderately suited to pasture and hay. On pasture, erosion can be a hazard unless a good cover of forage plants is maintained. Good management practices will insure adequate cover and will maintain a high level of forage production. Applicable management practices include fertilizing and liming, maintaining an adequate legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Steepness of slope is a moderate limitation

for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is moderately suited to residential or commercial development. Slope is a moderate limitation because grading or excavating is required for most uses. Seepage is a severe limitation for sewage lagoons and area sanitary landfills. The gravel in this soil is a moderate limitation for lawns and landscaping and for use as cover material. On construction sites, conservation measures are needed during construction to control erosion. This soil is subject to slippage and landslides when cuts are made across the slope.

This soil is in land capability subclass IVe.

### **DeF—Dellrose gravelly silt loam, 20 to 60 percent slopes**

This is a very deep, well drained soil on side slopes in the highly dissected areas in the outer part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 400 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, dark brown gravelly silt loam

*Subsoil:*

9 to 18 inches, brown gravelly silt loam

18 to 68 inches, brown and strong brown gravelly silty clay loam

Included with this soil in mapping are small areas of Mimosa soils, which have a clayey subsoil. Also included, on the upper part of slopes, are some areas of Hawthorne soils, which are more than 35 percent rock fragments and 20 to 40 inches deep over soft bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid, but the lower part of the subsoil, where clayey, is moderate

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid or strongly acid, but in limed areas the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Practically all areas of this soil are used as pasture or woodland.

This soil is not suited to cultivated crops because of

steep slopes. It is poorly suited to pasture because maintaining pasture on steep slopes is difficult. Operating farm equipment on these slopes is hazardous.

Trees grow well on this soil, which is only moderately suited to woodland because of management problems caused by steep slopes. Use of equipment is severely limited, and erosion is a severe hazard. Slippage can occur when cuts for logging roads or skid trails are made across slopes. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is unsuited to residential or commercial development because of steep slopes and a severe hazard of slippage when cuts are made across the slope.

This soil is in land capability subclass VIIe.

### **DoB—Dowellton silty clay loam, 1 to 4 percent slopes**

This is a deep, poorly drained soil in depressions on uplands and on benches or terraces. Individual areas of this soil vary in shape and range from 5 to 45 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 4 inches, dark grayish brown silty clay loam

*Subsurface layer:*

4 to 10 inches, gray silty clay loam

*Subsoil:*

10 to 44 inches, light brownish gray and light gray clay

*Bedrock:*

44 inches, hard limestone bedrock

Included with this soil in mapping are some small areas of somewhat poorly drained soils. Also included are a few areas of similar soils that are less than 40 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Slow

*Available water capacity:* Moderate or high

*Soil reaction:* Strongly acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* High

*Depth to the water table:* 0.5 to 1 foot during wet periods

Most areas of this soil are used for pasture or hay. A few areas are used as woodland.

This soil is poorly suited to row crops and small grain because of wetness and the susceptibility to ponding. Only short- season crops, such as soybeans, can be planted because wetness interferes with timely planting and harvesting.

This soil is moderately suited to pasture and hay. Water-tolerant forage plants, such as tall fescue and ladino clover, are best suited. Limiting grazing during wet periods helps to prevent surface compaction.

This soil is moderately suited to woodland use. Equipment use is restricted to dry periods in summer and fall because of wetness. Seedling mortality, which is high because of wetness, should be considered in determining stocking rates. Trees suitable for planting or feasible to manage for production include sweetgum and American sycamore. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. Wetness, slow permeability, high clay content, and high shrink-swell potential are severe limitations.

This soil is in land capability subclass IVw.

### **Eg—Egam silt loam, occasionally flooded**

This is a very deep, moderately well drained soil on flood plains. Slopes range from 0 to 3 percent. Individual areas of this soil range from 5 to 120 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 7 inches, very dark grayish brown silt loam  
7 to 23 inches, very dark grayish brown silty clay loam

*Subsoil:*

23 to 45 inches, dark brown silty clay  
45 to 65 inches, brown silty clay

Included with this soil in mapping are small areas of well drained Armour soils and moderately well drained Lindell soils, which are both loamy. These soils are on flood plains in positions similar to those of the Egam soil. Also included, in old abandoned river channels near Dixon Springs, are a few areas of poorly drained soils. Also included, along small streams and drainageways, are a few areas of soils less than 60 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* High

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* Occasional

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* 3 to 4 feet in winter and early spring

Most areas of this soil have been cleared and are used for row crops, pasture, or hay. A few small, isolated areas are used as woodland.

This soil is well suited to most cultivated crops. Flooding can delay planting in spring and can damage young plants. Wetness can damage sensitive crops, such as tobacco. Under good management, most crops will produce good yields. Surface drainage will help to remove excess water from low spots.

This soil is well suited to hay and pasture. Most forage plants are suited, except those sensitive to wetness, such as alfalfa. Limiting grazing during wet periods will prevent surface compaction.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Adapted tree species that can be planted or managed on this soil include southern red oak, yellow-poplar, loblolly pine, and black walnut.

This soil is not suited to residential or commercial development because of flooding and wetness. Low strength is also a limitation.

This soil is in land capability subclass IIw.

### **HaC2—Hampshire silt loam, 5 to 12 percent slopes, eroded**

This is a deep, well drained soil on ridgetops and the upper part of hillsides in the outer part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, brown silt loam

*Subsoil:*

6 to 10 inches, dark yellowish brown silt loam

10 to 37 inches, strong brown clay and channery clay

*Substratum:*

37 to 49 inches, strong brown very channery silty clay loam

49 to 60 inches, soft, weathered siltstone and shale

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some small areas of Sandhill, Hicks, and Inman soils. Also included are some areas that have a few limestone outcrops.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid to very strongly acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture, hay, or row crops. A few areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay production. Most forage crops grown in this area are suited. On pasture, fertilizing and liming at levels recommended by soil tests and preventing overgrazing will sustain productivity and help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and southern red oak. Care should be taken to minimize disturbance of the ground cover during harvesting and management operations because erosion is a moderate hazard. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. For some uses the side slope will require grading and excavating. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. The moderate shrink-

swell potential is a limitation for dwellings and small commercial buildings. This limitation can be overcome by placing extra reinforcements in footings and foundations or by backfilling with sandy material.

Depth to bedrock is a limitation for excavations.

This soil is in land capability subclass IIIe.

## **HaD2—Hampshire silt loam, 12 to 25 percent slopes, eroded**

This is a deep, well drained soil on the sides of hills and ridges in the outer part of the Nashville Basin. Individual areas of this soil are irregular in shape and range from 5 to 70 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 6 inches, brown silt loam

*Subsoil:*

6 to 10 inches, dark yellowish brown silt loam

10 to 37 inches, strong brown clay and channery clay

*Substratum:*

37 to 49 inches, strong brown very channery silty clay loam

49 to 60 inches, soft, weathered siltstone and shale

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some small areas of Sandhill and Inman soils. Also included are a few areas that have limestone outcrops.

Important soil properties and features of this soil are—

*Permeability:* Moderate slow

*Available water capacity:* Moderate or high

*Soil reaction:* Moderately acid to very strongly acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops because of slope and the erosion hazard. It is moderately suited to pasture and hay. On pasture, erosion can be a hazard unless a good cover of forage plants is maintained. Good management practices will insure adequate cover and will maintain a high level of forage production. Applicable management practices include

fertilizing and liming, maintaining a good legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and southern red oak. Erosion is a hazard; therefore, care should be taken to minimize disturbance of the ground cover during harvesting and management operations. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. For most uses moderately steep slopes will require grading and excavating. On construction sites, conservation measures are needed during construction to control erosion. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. Depth to bedrock is a limitation for excavations.

This soil is in land capability subclass IVe.

### **HgD—Hawthorne gravelly silt loam, 5 to 20 percent slopes**

This is a moderately deep, somewhat excessively drained soil on ridgetops of dissected uplands on the Highland Rim, remnants of which are mostly in the northern and southeastern parts of the county. Individual areas of this soil are long and narrow and range from 5 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, brown gravelly silt loam

*Subsoil:*

9 to 16 inches, dark yellowish brown gravelly silt loam  
16 to 27 inches, yellowish brown very gravelly silt loam

*Substratum:*

27 to 60 inches, weathered, rippable siltstone and chert

Included with this soil in mapping are small areas of Sengtown soils, which have a red, clayey subsoil and are less than 35 percent rock fragments. Also included are a few areas of very deep Dellrose soils, which are less than 35 percent rock fragments.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Low

*Soil reaction:* Strongly acid to extremely acid

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep to soft bedrock

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or woodland. A few small areas are used for row crops.

This soil is poorly suited to row crops because of low available water capacity and a severe erosion hazard. Rock fragments limit tillage operations.

This soil is moderately suited to pasture and hay. It is droughty because of low available water capacity. Rock fragments interfere with some management operations.

This soil is moderately suited to woodland use. Trees suitable for planting or feasible to manage for production include loblolly pine, shortleaf pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Seedling survival is lowered by the lack of adequate soil moisture. The growth rate of trees is only moderate because of low available water capacity.

This soil is poorly suited to residential or commercial development because of depth to bedrock, rock fragments, and slopes. Individual areas of this soil are narrow and convex and are directly adjacent to steep and very steep hillsides.

This soil is in land capability subclass VI.

### **HgF—Hawthorne gravelly silt loam, 20 to 60 percent slopes**

This is a moderately deep, somewhat excessively drained soil on hillsides of highly dissected uplands on remnants of the Highland Rim. Individual areas of this soil are irregular in shape and range from 10 to 1,300 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, brown gravelly silt loam

*Subsoil:*

9 to 16 inches, dark yellowish brown gravelly silt loam  
16 to 27 inches, yellowish brown very gravelly silt loam

*Substratum:*

27 to 60 inches, weathered, rippable siltstone and chert

Included with this soil, on concave slopes and benches, are some areas of very deep Dellrose soils,

which are less than 35 percent rock fragments. Also included, on slope shoulders, are a few areas of clayey Sengtown soils, which have fewer rock fragments than the Hawthorne soil. Also included are some areas of soils that are less than 20 inches deep over hard bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Low

*Soil reaction:* Strongly acid to extremely acid

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used as woodland, but a few areas are used for pasture.

This soil is not suited to row crops and is poorly suited to pasture. A severe erosion hazard, low available water capacity, and steep and very steep slopes are limiting factors.

This soil is poorly suited to woodland use. Trees suitable for planting or feasible to manage for production include loblolly pine, shortleaf pine, and southern red oak. Standard equipment is severely limited by steep and very steep slopes. Erosion is a hazard on logging roads and skid trails. Seedling survival is reduced by low available water capacity and shallow rooting depth.

This soil is not suited to residential or commercial development because of steep slopes and depth to rock.

This soil is in land capability subclass VIIc.

### **HkB2—Hicks silt loam, 2 to 5 percent slopes, eroded**

This is a deep, well drained soil on upland ridgetops, mostly in the western and southern parts of the county. Individual areas of this soil range from 5 to 70 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 10 inches, brown silt loam

*Subsoil:*

10 to 38 inches, yellowish brown and strong brown silty clay loam

38 to 52 inches, brown very channery clay loam

*Substratum:*

52 to 60 inches, soft, weathered, interbedded siltstone and limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Sandhill and Hampshire soils. Sandhill soils have more rock fragments than the Hicks soil. Hampshire soils have a clayey subsoil. Also included, in depressions, are a few small areas of soils that are somewhat poorly drained.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture, hay, or row crops.

This soil is well suited to row crops. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to hay and pasture. It has no serious limitations. If limed and fertilized, it will produce good yields of forage crops.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. Depth to bedrock is a moderate limitation for most sanitary facilities.

This soil is in land capability subclass IIc.

### **HkC2—Hicks silt loam, 5 to 12 percent slopes, eroded**

This is a deep, well drained soil on broad, rounded ridgetops and the upper part of hillsides, mostly in the

southern and western parts of the county. Individual areas of this soil are irregular in shape and range from 5 to 190 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 10 inches, brown silt loam

*Subsoil:*

10 to 38 inches, yellowish brown and strong brown silty clay loam

38 to 52 inches, brown very channery clay loam

*Substratum:*

52 to 60 inches, soft, weathered, interbedded siltstone and limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Sandhill and Hampshire soils. Sandhill soils have more rock fragments than the Hicks soil. Hampshire soils have a clayey subsoil.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. A few areas are used for row crops. A few small areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay. Most forage crops grown in this area are adapted. On pasture, fertilizing and liming at levels recommended by soil tests, controlling weeds, and preventing overgrazing will sustain productivity and help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for

production include yellow-poplar, loblolly pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. On some units slope and depth to bedrock are moderate limitations.

This soil is in land capability subclass IIIe.

### **HoB2—Holston loam, 2 to 5 percent slopes, eroded**

This is a very deep, well drained soil on terraces of the Cumberland River. Individual areas of this soil are irregular in shape and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 8 inches, dark yellowish brown loam

*Subsoil:*

8 to 70 inches, strong brown clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of Armour soils, which have less sand than this Holston soil. Also included are some areas of soils that have a clayey subsoil that is redder than the subsoil in this Holston soil. Also included, in the slightly lower positions, are a few small areas of moderately well drained Paden soils, which have a fragipan.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for row crops, pasture, or hay.

This soil is well suited to row crops. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways,

and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to hay and pasture. It has no serious limitations. If limed and fertilized, it will produce good yields of forage crops.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to residential or commercial development. For some uses the moderate limitations can be overcome by design.

This soil is in land capability subclass IIe.

### **HoC2—Holston loam, 5 to 12 percent slopes, eroded**

This is a very deep, well drained soil on terraces of the Cumberland River. Individual areas of this soil are irregular in shape and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 8 inches, dark yellowish brown loam

*Subsoil:*

8 to 70 inches, strong brown clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of Armour soils, which have less sand than the Holston soil. Also included are some areas of soils that have a clayey subsoil that is redder than the subsoil in the Holston soil. Also included, in lower areas or in depressions, are a few small areas of moderately well drained Paden soils, which have a fragipan.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for row crops or for hay and pasture. A few areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to pasture and hay. Most forage crops commonly grown in this area are adapted. On pasture, fertilizing and liming at levels recommended by soil tests, controlling weeds, and preventing overgrazing will sustain productivity and help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is well suited to residential or commercial development. Slope is a moderate limitation for most uses.

This soil is in land capability subclass IIIe.

### **HoD2—Holston loam, 12 to 25 percent slopes, eroded**

This is a very deep, well drained soil on side slopes in dissected areas of old terraces along the Cumberland River.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 8 inches, dark yellowish brown loam

*Subsoil:*

8 to 70 inches, strong brown clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some areas of soils that have a clayey subsoil that is redder than the subsoil in the Holston soil. Some small areas have soft, siltstone bedrock within a depth of 60 inches. Also included are some areas of soils that are more than 15 percent gravel in the surface layer.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops because of slope and the erosion hazard. It is moderately suited to pasture and hay. On pasture, erosion is a hazard unless a good cover of forage plants is maintained. Good management practices will insure adequate cover and will maintain a high level of forage production. Applicable management practices include fertilizing and liming, maintaining an adequate legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is moderately suited to residential or commercial development. The slope may require grading or excavating. Overcoming slope becomes increasingly difficult and expensive as the slopes become steeper on this soil. On construction sites, conservation measures are needed during construction to control erosion.

This soil is in land capability subclass IVe.

### **InC2—Inman flaggy silt loam, 5 to 12 percent slopes, eroded**

This is a moderately deep, well drained soil on rounded ridgetops and hillsides in areas underlain by interbedded limestone and shale bedrock. Individual areas of this soil are irregular in shape and range from 5 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, dark grayish brown flaggy silt loam

*Subsoil:*

5 to 20 inches, yellowish brown flaggy clay

20 to 35 inches, brown flaggy clay

*Substratum:*

35 to 60 inches, interbedded, weathered shale and limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Sandhill, Hampshire, and Talbott soils. Sandhill soils are loamy in the subsoil and 40 to 60 inches deep to bedrock. Hampshire soils are 40 to 60 inches deep to bedrock. Talbott soils, which are lower on the landscape and have a redder subsoil than that in the Inman soil, are 20 to 40 inches deep to hard, massive bedrock. Also included are some exposed ledges of flat, massive limestone as much as several feet wide. Near these rocks are some "seep springs," where the soils are moderately well drained to poorly drained.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

This soil is used mostly as pasture or woodland. It is poorly suited to cultivated crops because of rock fragments, low available water capacity, and the erosion hazard.

This soil is moderately suited to pasture. Yields of most grasses and legumes are limited by the effective rooting depth and the available water capacity.

This soil is moderately suited to woodland use. Low available water capacity, which limits productivity and contributes to seedling mortality, should be considered in determining stocking rates and species suitability. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this soil include loblolly pine, shortleaf pine, black locust, and eastern redcedar.

This soil is poorly suited to residential or commercial development. Depth to bedrock, shrink-

swell potential, and numerous rock fragments are severe limitations. Low strength is a severe limitation for roads.

This soil is in land capability subclass IVe.

### **InD2—Inman flaggy silt loam, 12 to 25 percent slopes, eroded**

This is a moderately deep, well drained soil on hillsides in areas of interbedded limestone and shale bedrock. Individual areas of this soil are irregular in shape and range from 5 to 140 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, dark grayish brown flaggy silt loam

*Subsoil:*

5 to 20 inches, yellowish brown flaggy clay

20 to 35 inches, brown flaggy clay

*Substratum:*

35 to 60 inches, interbedded, weathered shale and limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Sandhill, Hampshire, and Talbott soils. Sandhill soils are loamy in the subsoil and are 40 to 60 inches deep to bedrock. Hampshire soils are 40 to 60 inches deep to bedrock. Talbott soils are lower on the landscape than the Inman soil, have a redder subsoil than that in the Inman soil, and are 20 to 40 inches deep to hard, massive bedrock. Also included are some exposed ledges of flat, massive limestone as much as several feet wide. Near these rocks are some “seep springs,” where the soils are moderately well drained to poorly drained.

Important properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

This soil is used mostly as pasture or woodland. It is not suited to cropland because of slope, the erosion hazard, and rock fragments.

This soil is moderately suited to pasture. Yields are limited because of low available water capacity. Management activities are hindered by rock fragments.

This soil is moderately suited to woodland use. Low available water capacity, which limits productivity and contributes to seedling mortality, should be considered in determining stocking rates and species suitability. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this soil include loblolly pine, shortleaf pine, black locust, and eastern redcedar. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is poorly suited to residential or commercial development. Slope, depth to bedrock, shrink-swell potential, and numerous rock fragments are severe limitations. Low strength is a severe limitation for roads.

This soil is in land capability subclass VIe.

### **IsD2—Inman-Sandhill complex, 10 to 20 percent slopes, eroded**

This map unit consists of Inman and Sandhill soils in areas so small or narrow that they could not be separated in mapping. These soils formed in material weathered from bedrock consisting of thin, interbedded layers of siltstone, limestone, and shale. Areas of the individual soils run lengthwise, parallel to the slope. In most areas the Sandhill soil is on the upper slopes, where the bedrock is mostly interbedded siltstone and limestone. The Inman soil is on the lower slopes, where the bedrock is mostly limestone and shale. The proportion of each soil varies in individual areas. The Inman soil makes up 35 to 60 percent of the unit, and the Sandhill soil makes up 20 to 40 percent. Individual areas of this unit vary in shape and range from 5 to 120 acres.

The typical sequence, depth, and composition of the layers of this Inman soil are—

*Surface layer:*

0 to 5 inches, dark grayish brown flaggy silt loam

*Subsoil:*

5 to 20 inches, yellowish brown flaggy clay

20 to 35 inches, brown flaggy clay

*Substratum:*

35 to 60 inches, interbedded, weathered shale and limestone

The typical sequence, depth, and composition of the layers of this Sandhill soil are—

*Surface layer:*

0 to 9 inches, brown channery silt loam

*Subsoil:*

9 to 53 inches, strong brown channery silt loam

*Substratum:*

53 to 70 inches, soft siltstone interbedded with strong brown silt clay loam

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included in mapping are small areas of Hampshire and Barfield soils. Hampshire soils are 40 to 60 inches deep over bedrock and have a clayey subsoil. Barfield soils are less than 20 inches deep over limestone bedrock. Also included are a few areas of soils that are similar to the Sandhill soil but that are less than 40 inches deep over bedrock. Some areas have individual limestone outcrops or large ledges of hard limestone. A few areas have “seep springs”, where the soils are moderately well drained to poorly drained.

Important properties and features of this Inman soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Important properties and features of this Sandhill soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this unit are used for pasture or woodland. These soils are not suited to row crops because of the erosion hazard, limited available water capacity, and rock fragments.

This unit is moderately suited to pasture. Drought-tolerant forages are best suited because of a low or moderate available water capacity. In some areas rock fragments can interfere with pasture management operations. This unit is highly susceptible to erosion.

Maintaining a good cover of vegetation helps to control erosion.

This unit is moderately suited to woodland use. Low available water capacity, which limits productivity and contributes to seedling mortality, should be considered in determining stocking rates. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this soil include loblolly pine, shortleaf pine, black locust, and eastern redcedar. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is poorly suited to residential or commercial development. Slope, depth to bedrock, shrink-swell potential, and numerous rock fragments are severe limitations. Low strength is a severe limitation for roads.

This soil is in land capability subclass Vle.

### **Ln—Lindell silt loam, occasionally flooded**

This very deep, moderately well drained soil is on flood plains and in drainageways and depressions. Slopes range from 0 to 3 percent. Individual areas of this soil are long and narrow and range from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 10 inches, brown silt loam

*Subsoil:*

10 to 32 inches, brown silt loam

32 to 44 inches, dark grayish brown silty clay loam

*Substratum:*

44 to 79 inches, grayish brown silty clay loam

Included with this soil in mapping are small areas of well drained Arrington soils in slightly higher positions on flood plains than those of the Lindell soil. Also included, in depressions and in the lower areas, are some small areas of somewhat poorly drained soils. Also included are some areas of soils that are shallower than 60 inches to bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* High

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* Occasional

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* 2 to 3 feet in winter and early spring

Most areas of this soil have been cleared and are used for row crops, pasture, or hay. A few small, isolated areas are used as woodland.

This soil is well suited to most cultivated crops. In wet years flooding and wetness can delay planting or damage young plants. Wetness and flooding can damage sensitive crops, such as tobacco. Most crops produce good yields on this soil.

This soil is well suited to hay and pasture. Plants that are sensitive to wetness and flooding, such as alfalfa, should be planted in the higher areas. Limiting grazing during wet periods will help to prevent surface compaction.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and cherrybark oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is not suited to residential or commercial development because of flooding and seasonal wetness. Low strength is also a limitation for roads and streets.

This soil is in land capability subclass IIw.

### **MmC2—Mimosa-Ashwood complex, 5 to 12 percent slopes, eroded**

This map unit consists of Mimosa and Ashwood soils in areas so intricately mixed or so small in size that they could not be separated in mapping. These soils formed in residuum of limestone on uplands. The proportion of each soil varies from one area to another. The Mimosa soil makes up 40 to 70 percent of the unit, and the Ashwood soil makes up 15 to 35 percent. Individual areas of this unit vary in shape and range from 5 to 280 acres.

The typical sequence, depth, and composition of the layers of this Mimosa soil are—

*Surface layer:*  
0 to 6 inches, brown silt loam

*Subsoil:*  
6 to 55 inches, yellowish brown clay

*Bedrock:*  
55 inches, hard limestone bedrock

The typical sequence, depth, and composition of the layers of this Ashwood soil are—

*Surface layer:*  
0 to 8 inches, dark brown silt loam

*Subsoil:*  
8 to 13 inches, dark brown silty clay loam  
13 to 23 inches, dark yellowish brown clay  
23 to 31 inches, yellowish brown clay

*Bedrock:*  
31 inches, hard limestone bedrock

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included in mapping are small areas of Barfield soils and some areas of rock outcrops. Also included are a few areas of Sykes soils on foot slopes.

Important soil properties and features of this Mimosa soil are—

*Permeability:* Slow  
*Available water capacity:* Moderate  
*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer and the layer just above bedrock are less acid  
*Flood hazard:* None  
*Depth to bedrock:* Deep  
*Shrink-swell potential:* High  
*Depth to the water table:* More than 6 feet

Important properties and features of this Ashwood soil are—

*Permeability:* Moderately slow  
*Available water capacity:* Low or moderate  
*Soil reaction:* Moderately acid to neutral  
*Flooding frequency:* None  
*Depth to bedrock:* Moderately deep  
*Shrink-swell potential:* High  
*Depth to the water table:* More than 6 feet

Most areas of this unit are used for pasture. Some small areas are used as woodland or for row crops.

This unit is poorly suited to row crops. Yields are low because of low or moderate available water capacity. Erosion is a severe hazard in cultivated areas.

This unit is moderately suited to pasture and hay. Forage plants that can withstand droughty conditions, such as tall fescue, are best suited.

This unit is moderately suited to woodland use. Productivity is limited by low or moderate available water capacity. Seedling mortality, which is a concern in spots where erosion has removed most of the original surface layer, should be considered in

determining stocking rates. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this unit include southern red oak, black locust, eastern redcedar, and loblolly pine.

This unit is poorly suited to residential or commercial development. Slope, slow permeability, low strength, depth to bedrock, and high shrink-swell potential are difficult limitations to overcome.

This unit is in land capability subclass IVe.

### **MrC—Mimosa-Ashwood complex, 5 to 12 percent slopes, rocky**

This map unit consists of Mimosa and Ashwood soils in areas so intricately mixed or so small in size that they could not be separated in mapping. These soils formed in residuum of limestone on uplands. The proportion of each soil varies from one area to another. The Mimosa soil makes up 35 to 75 percent of the unit, and the Ashwood soil makes up 15 to 50 percent. Limestone outcrops make up 2 to 10 percent of each area. Individual areas of the unit are irregular in shape and range from 5 to 120 acres.

The typical sequence, depth, and composition of the layers of this Mimosa soil are—

*Surface layer:*

0 to 6 inches, brown silt loam

*Subsoil:*

6 to 55 inches, yellowish brown clay

*Bedrock:*

55 inches, hard limestone bedrock

The typical sequence, depth, and composition of the layers of this Ashwood soil are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 13 inches, dark brown silty clay loam

13 to 23 inches, dark yellowish brown clay

23 to 31 inches, yellowish brown clay

*Bedrock:*

31 inches, hard limestone bedrock

Included in mapping are small areas of Barfield soils and a few small areas of Sykes soils. Included soils make up 10 to 30 percent of the unit.

Important soil properties and features of this Mimosa soil are—

*Permeability:* Slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer and the layer just above bedrock are less acid

*Flood hazard:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Important properties and features of this Ashwood soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low or moderate

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Most areas of this unit are used for pasture. The rest are used as woodland.

This unit is poorly suited to row crops. Rock outcrop interferes with tillage operations. Yields are low because of low or moderate available water capacity. Erosion is a severe hazard in cultivated areas.

This unit is moderately suited to pasture and hay. Forage plants that can withstand droughty conditions, such as tall fescue, are the best suited. In some areas rock outcrops extend high enough above the surface to interfere with hay and pasture management operations.

This unit is moderately suited to woodland use. Productivity is limited by low or moderate available water capacity. Seedling mortality, which is a concern in spots where erosion has removed most of the original surface layer, should be considered in determining stocking rates. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this unit include southern red oak, black locust, eastern redcedar, and loblolly pine.

This unit is poorly suited to residential or commercial development. Rock outcrops, slope, slow permeability, low strength, depth to bedrock, and high shrink-swell potential are difficult limitations to overcome.

This unit is in land capability subclass IVs.

### **MrD2—Mimosa-Ashwood complex, 12 to 30 percent slopes, eroded, rocky**

This map unit consists of Mimosa and Ashwood soils in areas so intricately mixed or so small in size that they could not be separated in mapping. These soils formed in residuum of limestone on uplands. The proportion of each soil varies from one area to another. The Mimosa soil makes up 30 to 50 percent of the map unit, and the Ashwood soil makes up 25 to 40 percent. Limestone outcrops make up 2 to 10 percent of each mapped area. Individual areas of the unit are irregular in shape and range from 5 to 600 acres.

The typical sequence, depth, and composition of the layers of this Mimosa soil are—

*Surface layer:*

0 to 6 inches, brown silt loam

*Subsoil:*

6 to 55 inches, yellowish brown clay

*Bedrock:*

55 inches, hard limestone bedrock

The typical sequence, depth, and composition of the layers of this Ashwood soil are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 13 inches, dark brown silty clay loam  
13 to 23 inches, dark yellowish brown clay  
23 to 31 inches, yellowish brown clay

*Bedrock:*

31 inches, hard limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included in mapping are small areas of soils that are less than 20 inches deep to bedrock. Also included, mostly in areas below Hawthorne soils, are some small areas of Dellrose soils. Also included, in drainageways and depressions, are a few small areas of Armour soils. Included soils make up 10 to 25 percent of the unit.

Important soil properties and features of this Mimosa soil are—

*Permeability:* Slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer and the layer just above bedrock are less acid

*Flood hazard:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Important properties and features of this Ashwood soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low or moderate

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* High

*Depth to the water table:* More than 6 feet

Most areas of this unit are used for pasture. Some areas are used as woodland or are idle.

This unit is not suited to row crops because of a severe erosion hazard, rock outcrops, and the limited available water capacity.

This unit is moderately suited to pasture and hay. Forage plants that can withstand droughty conditions, such as tall fescue, are best suited. In some areas rock outcrops extend high enough above the surface to interfere with hay and pasture management operations. This unit is highly susceptible to erosion because of moderately steep and steep slopes. Maintaining a good cover of vegetation helps to control erosion.

This unit is moderately suited to woodland use. Productivity is limited by low or moderate available water capacity. Seedling mortality, which is a concern in spots where erosion has removed most of the original surface layer, should be considered in determining stocking rates. After harvest, careful management is needed to control plant competition, which can reduce the productivity of desired species. Trees suitable to manage or plant on this unit include black locust, eastern redcedar, loblolly pine, and shortleaf pine. Steepness of slope is a moderate limitation for equipment use. Erosion is a hazard on logging roads and skid trails.

This soil is poorly suited to residential or commercial development. Slope, rock outcrops, slow permeability, low strength, depth to bedrock, and high shrink-swell potential are difficult limitations to overcome.

This unit is in land capability subclass VI<sub>s</sub>.

### **No—Norene silt loam, rarely flooded**

This is a very deep, poorly drained soil formed in silty alluvium on low stream terraces, in depressions,

and at the head of drainageways. Slopes range from 0 to 2 percent. Most units are on nearly level terraces of the Cumberland River, west of Carthage. Individual areas of this soil vary in shape and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 10 inches, dark brown silt loam

*Subsoil:*

10 to 17 inches, grayish brown silt loam

17 to 46 inches, grayish brown silt loam and silty clay loam

46 to 65 inches, gray silty clay loam

Included with this soil in mapping are some areas of soils that have a clayey subsoil. Also included are a few areas of moderately well drained soils.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* High

*Soil reaction:* Strongly acid to neutral

*Flood hazard:* Rare; some areas are subject to flooding of brief duration; during wet periods some areas are subject to ponding of brief duration

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

*Depth to the water table:* 0.5 to 1.0 feet in winter and early spring

Most areas of this soil are used for pasture or hay. Some areas are used as woodland.

This soil is poorly suited to row crops and small grains because of wetness and ponding in some areas. Wetness can interfere with planting and harvesting operations, and can damage those crops sensitive to wetness.

This soil is moderately suited to pasture and hay. Water-tolerant forage species should be selected for planting. Limiting grazing during wet periods will help to prevent surface compaction.

This soil is moderately suited to woodland use. Equipment use is limited to dry periods in summer and fall because of wetness. Seedling mortality is high because of wetness and ponding. Trees suitable for planting or feasible to manage for production include sweetgum and eastern cottonwood. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development because of wetness,

flooding, and ponding. Slow permeability and low strength are also limitations.

This soil is in land capability subclass IVw.

### **Oc—Ocana gravelly silt loam, occasionally flooded**

This is a very deep, well drained, gravelly soil on flood plains of creeks and small streams. Slopes range from 0 to 3 percent. Most areas are long and narrow and range from 5 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 8 inches, dark brown gravelly silt loam

*Subsoil:*

8 to 36 inches, dark yellowish brown gravelly silt loam

36 to 60 inches, dark yellowish brown very gravelly silt loam

Included with this soil in mapping are some small areas of soils that are similar to the Ocana soil but are moderately well drained, areas of Arrington soils, and areas of soils that are less than 60 inches deep to bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* Occasional, very brief duration

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Low

Most areas of this soil are used for row crops, hay, or pasture. A few areas are used as woodland.

This soil is moderately suited to row crops. In some years flooding can delay the planting of crops. Rock fragments interfere with tillage and reduce yields because of the limited available water capacity.

This soil is well suited to pasture and hay. In a few areas rock fragments as large as 3 inches interfere with mowing.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and white oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is not suited to residential or commercial development because of the flood hazard.

This soil is in land capability subclass IIw.

### **PaB—Paden silt loam, 2 to 5 percent slopes**

This is a very deep, moderately well drained soil on stream terraces. It has a fragipan in the subsoil that restricts water movement and root growth. Individual areas of this soil vary in shape and range from 5 to 80 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, dark yellowish brown silt loam

*Subsoil:*

9 to 25 inches, dark yellowish brown and yellowish brown silt loam

25 to 37 inches, mottled light yellowish brown, light brownish gray, and strong brown silt loam

37 to 62 inches, a fragipan of mottled light brownish gray, yellowish brown, and strong brown silt loam

Included with this soil in mapping are some small areas of Armour and Holston soils in positions slightly higher than those of the Paden soil. Also included, in lower landscape positions and in depressions, are a few areas of somewhat poorly drained soils.

Important soil properties and features of this soil are—

*Permeability:* Moderate above the fragipan and slow in the fragipan

*Available water capacity:* Moderate or high

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Depth to the water table:* Perched at a depth of 1.5 to 3 feet

Most areas of this soil are used for row crops, pasture, or hay. A few small areas are used as woodland.

This soil is moderately suited to row crops. Wetness delays planting and can damage sensitive crops. Erosion is a moderate hazard if row crops are grown.

This soil is well suited to hay and pasture. Plants sensitive to wetness, such as alfalfa, are only moderately suited. If limed and fertilized, this soil will produce good yields of forages.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include southern red oak, sweetgum, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species. Wetness

sometimes can limit the use of equipment. Some large or isolated trees are subject to windthrow because the fragipan restricts the growth of roots and the depth of root systems.

This soil is moderately suited to residential or commercial development. Wetness is a limitation for building site development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. This soil has a severe limitation for septic tank absorption fields because of slow permeability in the fragipan.

This soil is in land capability subclass IIe.

### **SaD2—Sandhill channery silt loam, 12 to 20 percent slopes, eroded**

This is a deep, well drained soil on hillsides. Individual areas of this soil vary in shape and range from 5 to 250 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, brown channery silt loam

*Subsoil:*

9 to 39 inches, strong brown channery silty clay loam  
39 to 53 inches, strong brown channery silt loam

*Substratum:*

53 to 70 inches, soft, horizontally bedded siltstone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Inman and Hampshire soils, both of which have a clayey subsoil. Inman soils are less than 40 inches deep to limestone bedrock and have limestone flags throughout.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used as pasture or woodland.

This soil is poorly suited to row crops because of

slope and the erosion hazard.

This soil is moderately suited to pasture. Yields are moderate because rock fragments reduce available water capacity. Slope causes moderately high runoff. Erosion is a hazard unless a good vegetative cover is maintained. Good management practices will insure an adequate vegetative cover. They include fertilizing and liming, maintaining an adequate legume-grass mixture, controlling weeds and brush, and preventing overgrazing.

This soil is moderately suited to woodland use. Productivity is limited because of moderate available water capacity and moderately high runoff. Slope causes a moderate erosion hazard and affects the use of equipment. Trees suitable for planting or feasible to manage for production include yellow-poplar, southern red oak, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. For most uses slope is a severe limitation. For some uses depth to bedrock and seepage are also limitations.

This soil is in land capability subclass IVe.

### **SaE2—Sandhill channery silt loam, 20 to 40 percent slopes, eroded**

This is deep, well drained soil on steep hillsides. Individual areas of this soil vary in shape and range from 10 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 9 inches, brown channery silt loam

*Subsoil:*

9 to 39 inches, strong brown channery silty clay loam  
39 to 53 inches, strong brown channery silt loam

*Substratum:*

53 to 70 inches, horizontally bedded siltstone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Inman and Hampshire soils, both of which have a clayey subsoil. Inman soils are less than 40 inches deep to limestone bedrock and have limestone flags throughout. A few severely eroded areas are dissected by large gullies.

Important soil properties and features of this soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Most areas of this soil are used as woodland or pasture.

This unit is not suited to row crops because of steep slopes.

This soil is poorly suited to pasture. The steep slopes and available water capacity are limitations. Pasture is difficult to establish and maintain. Forage production is low during dry periods. The erosion hazard is very severe unless a good cover of vegetation is maintained.

This unit is moderately suited to woodland use. Moderate available water capacity and steep slopes restrict tree growth and interfere with woodland management. Steep slopes limit use of equipment. Erosion is a hazard on logging roads and skid trails. Seedling mortality is a problem on south-facing slopes. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is not suited to residential or commercial development. Slope, depth to bedrock, and seepage are limitations.

This soil is in land capability subclass VIe.

### **SnE2—Sandhill-Inman complex, 20 to 40 percent slopes, eroded**

This map unit consists of Sandhill and Inman soils in areas so small or narrow that they could not be separated in mapping. These soils formed in material weathered from bedrock consisting of thin, interbedded layers of siltstone, limestone, and shale. Areas of the individual soils run lengthwise, parallel to the slope. In most areas the Sandhill soil is on the upper part of the slope, where the bedrock is mostly interbedded siltstone and limestone. The Inman soil is on the lower part of the slope, where bedrock is mostly limestone and shale. The proportion of each soil in individual areas varies. The Sandhill soil makes up about 30 to 65 percent of the unit, and the Inman soil

makes up about 15 to 40 percent. Individual areas of the unit vary in shape and range from 5 to 80 acres.

The typical sequence, depth, and composition of the layers of this Sandhill soil are—

*Surface layer:*

0 to 9 inches, brown channery silt loam

*Subsoil:*

9 to 39 inches, strong brown channery silty clay loam  
39 to 53 inches, strong brown channery silt loam

*Substratum:*

53 to 70 inches, soft, horizontally bedded siltstone

The typical sequence, depth, and composition of the layers of this Inman soil are—

*Surface layer:*

0 to 5 inches, dark grayish brown flaggy silt loam

*Subsoil:*

5 to 20 inches, yellowish brown flaggy clay  
20 to 35 inches, brown flaggy clay

*Substratum:*

35 to 60 inches, interbedded shale and limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included in mapping are small areas of Hampshire and Barfield soils. Hampshire soils are 40 to 60 inches deep to bedrock and have a clayey subsoil. Barfield soils are less than 20 inches deep to limestone bedrock. Also included are some areas of soils that are similar to the Sandhill soil but that are less than 40 inches deep to bedrock. Also included are some outcrops of limestone.

Important properties and features of this Sandhill soil are—

*Permeability:* Moderately rapid

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low

*Depth to the water table:* More than 6 feet

Important properties and features of this Inman soil are—

*Permeability:* Moderately slow

*Available water capacity:* Low

*Soil reaction:* Moderately acid to neutral

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this unit are used as woodland or pasture. This unit is not suited to crops because of steep slopes.

This unit is poorly suited to pasture. Steep slopes and low or moderate available water capacity limit the use of this map unit. Pasture is difficult to establish and maintain, and forage production is low during dry periods. The erosion hazard is very severe if vegetation is removed or if a good vegetative cover is not maintained.

This unit is moderately suited to woodland use. Moderate available water capacity and steep slopes restrict tree growth and interfere with woodland management. Steep slopes limit use of equipment. Erosion is a hazard on logging roads and skid trails. Seedling mortality is a problem on south-facing slopes. Trees suitable for planting or feasible to manage for production include yellow-poplar, loblolly pine, and southern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is not suited to residential or commercial development. Slope, depth to bedrock, and seepage are limitations.

This unit is in land capability subclass VIIe.

## **StB2—Sengtown gravelly silt loam, 2 to 5 percent slopes, eroded**

This is a very deep, well drained, gravelly soil on ridgetops in highly dissected uplands. Individual areas of this soil vary in shape and range from 5 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 7 inches, brown gravelly silt loam

*Subsoil:*

7 to 13 inches, yellowish red gravelly silty clay loam  
13 to 65 inches, yellowish red and red gravelly clay

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Hawthorne soils. Hawthorne soils have more than 35 percent rock fragments and are 20 to 40 inches deep to bedrock. Also included are small areas of soils that

have less clay in the subsoil and fewer rock fragments throughout than the Sengtown soil.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* Moderate

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most of the acreage of this soil is used for row crops, pasture, or hay.

This soil is well suited to row crops. Erosion is a moderate hazard if this unit is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture. In some areas rock fragments in the surface layer can interfere with tillage.

This soil is well suited to hay and pasture. It has no serious limitations. If limed and fertilized, it will produce good yields of forages.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include southern red oak, yellow-poplar, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. The moderate shrink-swell potential is a limitation for dwellings and small commercial buildings. This limitation can be overcome by placing extra reinforcements in footings and foundations or by backfilling with suitable material. The clayey subsoil is a limitation for landfills and excavations.

This soil is in land capability subclass IIe.

### **StC2—Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded**

This is a very deep, well drained, gravelly soil on long, narrow ridgetops in highly dissected uplands. Individual areas of this soil are long and winding in shape and range from 5 to 280 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 7 inches, brown gravelly silt loam

*Subsoil:*

7 to 13 inches, yellowish red gravelly silty clay loam

13 to 65 inches, yellowish red and red gravelly clay

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Hawthorne soils. Hawthorne soils have more than 35 percent rock fragments and are 20 to 40 inches deep to bedrock. Also included are small areas of soils that have less clay in the subsoil and fewer rock fragments throughout than the Sengtown soil.

Important soil properties and features of this soil are—

*Permeability:* Moderate

*Available water capacity:* Moderate

*Soil reaction:* Strongly acid or very strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Very deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture or hay. Some areas are used for row crops.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture. In some areas rock fragments in the surface layer can interfere with tillage (fig. 4).

This soil is well suited to pasture and hay. Most forage crops commonly grown in this area are adapted. On pasture, maintaining fertility and pH at levels recommended by soil tests, controlling weeds, and preventing overgrazing will sustain productivity and help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include yellow-poplar, southern red oak, and loblolly pine. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or



Figure 4.—An area of Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded. The rock fragments in the surface layer interfere with tillage.

commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. The moderate shrink-swell potential is a limitation for dwellings and small commercial buildings. This limitation can be overcome by placing extra reinforcements in footings or by backfilling with suitable material. The clayey subsoil is a limitation for landfills and excavations.

This soil is in land capability subclass IIIe.

### **SyB—Sykes silt loam, 2 to 5 percent slopes**

This is a deep, well drained soil on foot slopes and terraces of small streams. Individual areas of this soil vary in shape and range from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 28 inches, strong brown silt loam and silty clay loam

28 to 65 inches, strong brown and yellowish brown silty clay and clay

*Bedrock:*

65 inches, hard limestone bedrock

Included with this soil in mapping are small areas of Mimosa soils, which are clayey throughout the subsoil. Also included, in the lower positions, are a few areas of moderately well drained soils. Also included, in

drainageways, are a few areas of Arrington soils. Also included are some areas of soils that are similar to the Sykes soil but that are less than 60 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low to a depth of about 28 inches and moderate below that depth

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for row crops, pasture, or hay.

This soil is well suited to row crops. Erosion is a moderate hazard if this unit is intensively used for row crops. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is well suited to hay and pasture. It has no serious limitations. If limed and fertilized, it will produce good yields of forage crops.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. Moderately slow permeability is a severe limitation for septic tank absorption fields.

This soil is in land capability subclass IIe.

### **SyC2—Sykes silt loam, 5 to 12 percent slopes, eroded**

This is a deep, well drained soil on foot slopes and terraces of small streams. Individual areas of this soil vary in shape and range from 5 to 120 acres.

The typical sequence, depth, and composition of the layers are—

*Surface layer:*

0 to 8 inches, dark brown silt loam

*Subsoil:*

8 to 28 inches, strong brown silt loam and silty clay loam

28 to 65 inches, strong brown and yellowish brown silty clay and clay

*Bedrock:*

65 inches, hard limestone bedrock

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are small areas of Mimosa soils, which are clayey throughout the subsoil. Also included, in lower positions, are a few areas of moderately well drained soils. A few areas of Arrington soils are included in drainageways. Also included are some areas of soils that are similar to the Sykes soil but that are less than 60 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow

*Available water capacity:* High

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid

*Flooding frequency:* None

*Depth to bedrock:* Deep

*Shrink-swell potential:* Low to a depth of about 28 inches and moderate below that depth

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture, hay, or row crops. A few small areas are used as woodland.

This soil is moderately suited to row crops. Erosion is a severe hazard if this soil is intensively used for row crops. A management system that includes crop rotations, contour farming, and winter cover crops helps to control erosion. Crop residue management, minimum tillage, and stripcropping also help to control erosion.

This soil is well suited to pasture and hay. Most forage crops commonly grown in this area are adapted. On pasture, maintaining fertility and pH at levels recommended by soil tests, controlling weeds, and preventing overgrazing will sustain productivity and help to control erosion.

This soil is well suited to woodland use. Trees suitable for planting or feasible to manage for production include black walnut, yellow-poplar, loblolly pine, and northern red oak. After harvest and during

new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is moderately suited to residential or commercial development. Low strength is a severe limitation for local roads and streets. This limitation can be reduced or overcome by adding coarse gravel to the subgrade. Moderately slow permeability is a severe limitation for septic tank absorption fields.

This unit is in land capability subclass IIIe.

### **TaB2—Talbot silt loam, 2 to 5 percent slopes, eroded**

This is a moderately deep, well drained soil on uplands in the inner part of the Nashville Basin. Individual areas of this soil vary in shape and range from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, brown silt loam

*Subsoil:*

5 to 38 inches, yellowish red, red, and yellowish brown clay

*Bedrock:*

38 inches, hard limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some small areas of soils that are less than 20 inches deep to bedrock. Also included are some small areas of Bradyville soils, which are more than 40 inches deep over bedrock. Some areas have a few limestone outcrops.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow or slow

*Available water capacity:* Low or moderate

*Soil reaction:* Moderately acid or strongly acid, but the horizons near bedrock range to slightly alkaline and the surface layer is less acid where limed

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture, hay, or row crops. A few areas are used as woodland.

This soil is moderately suited to row crops. Yields are only moderate because of low or moderate available water capacity. Erosion is a moderate hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is moderately suited to hay and pasture. Forage plants grow well in spring and during other periods of adequate moisture if the soil is limed and fertilized. Productivity is low during the dry part of the year because of low or moderate available water capacity. Drought-tolerant forage plants that are resistant to moisture stress are best suited.

This soil is well suited to woodland use. In dry years tree growth is reduced because of low or moderate available water capacity. Trees suitable for planting or feasible to manage for production include loblolly pine, eastern redcedar, pignut hickory, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. For most uses depth to bedrock, the clayey subsoil, moderately slow or slow permeability, moderate shrink-swell potential, and low strength are limiting soil features. These limitations can be reduced or overcome for some uses by special design and construction. For uses where depth is critical, such as septic tank absorption fields and trench sanitary landfills, depth to bedrock is a difficult limitation to overcome.

This soil is in land capability subclass IIIe.

### **TaC2—Talbot silt loam, 5 to 12 percent slopes, eroded**

This is a moderately deep, well drained soil on uplands in the inner part of the Nashville Basin. Individual areas of this soil vary in shape and range from 5 to 260 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, brown silt loam

*Subsoil:*

5 to 38 inches, yellowish red, red, and yellowish brown clay

*Bedrock:*

38 inches, hard limestone

In most areas erosion has removed part of the original surface layer, and tillage has mixed the remaining topsoil and subsoil.

Included with this soil in mapping are some small areas of soils that are less than 20 inches deep to bedrock. Also included are some small areas of Bradyville soils, which are more than 40 inches deep over bedrock. Some areas have a few limestone outcrops.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow or slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid and the horizons near bedrock range to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil have been cleared and are used for pasture or hay. A few areas are used for row crops or as woodland.

This soil is poorly suited to row crops. Yields are only moderate because of low or moderate available water capacity. Erosion is a severe hazard if row crops are grown. A management system that includes crop rotations, contour farming, stripcropping, grassed waterways, and winter cover crops helps to control erosion. Crop residue management and minimum tillage help to control erosion and to conserve moisture.

This soil is moderately suited to hay and pasture. Forage plants grow well in spring and during other periods of adequate moisture if the soil is limed and fertilized. Productivity is low during the dry part of the year because of low or moderate available water capacity. Drought-tolerant forage plants that are resistant to moisture stress are best suited.

This soil is well suited to woodland use. In dry years tree growth is reduced because of low or moderate available water capacity. Trees suitable for planting or feasible to manage for production include loblolly pine, eastern redcedar, pignut hickory, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. For most uses depth to bedrock, the clayey subsoil, moderately slow or slow

permeability, moderate shrink-swell potential, and low strength are limiting soil features. For some uses these limitations can be reduced or overcome by special design and construction. For uses where depth is critical, such as septic tank absorption fields and trench sanitary landfills, depth to bedrock is a difficult limitation to overcome.

This soil is in land capability subclass IVe.

### **TrB—Talbot silt loam, 2 to 5 percent slopes, rocky**

This is a moderately deep, well drained soil on uplands in the inner part of the Nashville Basin. Outcrops of limestone make up 2 to 10 percent of the map unit. Individual areas of this map unit vary in shape and range from 5 to 90 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, brown silt loam

*Subsoil:*

5 to 38 inches, yellowish red, red, and yellowish brown clay

*Bedrock:*

38 inches, hard limestone

Included with this soil in mapping are some small areas of soils that are less than 20 inches deep to bedrock. Also included are some small areas of Bradyville soils, which are more than 40 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow or slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid and the horizons near bedrock range to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used for pasture. The rest are used as woodland.

This soil is poorly suited to row crops because rock outcrops interfere with tillage operations. Yields are only moderate because of low or moderate available water capacity. Erosion is a moderate hazard if row crops are grown.

This soil is moderately suited to hay and pasture. Forage plants grow well in spring and during other periods of adequate moisture if the soil is limed and fertilized. Productivity is low during the dry part of the year because of low or moderate available water capacity. Drought-tolerant forage plants that are resistant to moisture stress are best suited. Some areas have enough rock outcrops to interfere with pasture and hay management operations.

This soil is well suited to woodland use. In dry years tree growth is reduced because of low or moderate available water capacity. Trees suitable for planting or feasible to manage for production include loblolly pine, eastern redcedar, pignut hickory, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. For most uses depth to bedrock, rock outcrops, the clayey subsoil, moderately slow permeability, moderate shrink-swell potential, and low strength are limiting soil features. For some uses these limitations can be reduced or overcome by special design and construction. For uses where depth is critical, such as septic tank absorption fields and trench sanitary landfills, depth to bedrock and rock outcrops are difficult limitations to overcome.

This soil is in land capability subclass IVs.

### **TrC—Talbot silt loam, 5 to 12 percent slopes, rocky**

This is a moderately deep, well drained soil on uplands in the inner part of the Nashville Basin. Limestone outcrops make up 2 to 10 percent of the map unit. Individual areas of this soil vary in shape and range from 5 to 90 acres.

The typical sequence, depth, and composition of the layers of this soil are—

*Surface layer:*

0 to 5 inches, brown silt loam

*Subsoil:*

5 to 38 inches, yellowish red, red, and yellowish brown clay

*Bedrock:*

38 inches, hard limestone

Included with this soil in mapping are some small areas of soils that are less than 20 inches deep to

bedrock. Also included are some small areas of Bradyville soils, which are more than 40 inches deep over bedrock.

Important soil properties and features of this soil are—

*Permeability:* Moderately slow or slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid and the horizons near bedrock range to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this soil are used as pasture or woodland.

This soil is poorly suited to row crops because rock outcrops interfere with tillage operations. Yields are low because of low or moderate available water capacity and moderately high surface runoff. Erosion is a severe hazard if row crops are grown.

This soil is moderately suited to hay and pasture. Forage plants grow well in spring and during other periods of adequate moisture if the soil is limed and fertilized. Productivity is low during the dry part of the year because of low or moderate available water capacity. Drought-tolerant forage plants that are resistant to moisture stress are best suited. Some areas have enough rock outcrops to interfere with pasture or hay management operations.

This soil is well suited to woodland use. In dry years tree growth is reduced because of low or moderate available water capacity. Trees suitable for planting or feasible to manage for production include loblolly pine, eastern redcedar, pignut hickory, and northern red oak. After harvest and during new plantings, careful management is needed to control plant competition and to favor the desired species.

This soil is poorly suited to residential or commercial development. For most uses depth to bedrock, rock outcrops, the clayey subsoil, moderately slow or slow permeability, moderate shrink-swell potential, and low strength are limiting soil features. For some uses these limitations can be reduced or overcome by special design and construction. For uses where depth is critical, such as septic tank absorption fields and trench sanitary landfills, depth to bedrock and rock outcrops are difficult limitations to overcome.

This soil is in land capability subclass IVs.

### **TxD—Talbot-Rock outcrop complex, 5 to 20 percent slopes**

This map unit consists of a Talbot soil and Rock outcrop in areas so intricately intermixed that they could not be separated in mapping. The proportion of each component varies from one area to another. The Talbot soil makes up about 50 to 80 percent of the map unit, and Rock outcrop makes up about 15 to 30 percent. This unit is on uplands in the inner part of the Nashville Basin. Individual areas of this unit vary in shape and range from 10 to 730 acres.

The typical sequence, depth, and composition of the layers of this Talbot soil are—

*Surface layer:*

0 to 5 inches, brown silt loam

*Subsoil:*

5 to 38 inches, yellowish red, red, and yellowish brown clay

*Bedrock:*

38 inches, hard limestone

Rock outcrop consists of massive, rounded limestone bedrock that extends from a few inches to 3 or 4 feet above the surface.

Included in mapping are some small areas of soils that are less than 20 inches deep over bedrock. Also included are some small areas of Bradyville soils, which are more than 40 inches deep over bedrock.

Important soil properties and features of this Talbot soil:

*Permeability:* Moderately slow or slow

*Available water capacity:* Moderate

*Soil reaction:* Moderately acid or strongly acid, but where limed the surface layer is less acid and the horizons near bedrock range to slightly alkaline

*Flooding frequency:* None

*Depth to bedrock:* Moderately deep

*Shrink-swell potential:* Moderate

*Depth to the water table:* More than 6 feet

Most areas of this unit are used as woodland. A few areas are used as pasture.

This map unit is not suited to row crops because of rock outcrops and moderately steep slopes.

This unit is poorly suited to pasture. Droughtiness and rock outcrops severely reduce forage yields and interfere with management operations.

This unit is moderately suited to woodland use. Limited available water capacity and rock outcrops restrict tree growth and interfere with woodland management. Trees suitable for planting or feasible to manage for production on this soil include eastern redcedar, pignut hickory, and Virginia pine.

This unit is poorly suited to residential or commercial development. Rock outcrops, slope, moderately slow or slow permeability, depth to bedrock, and moderate shrink-swell potential are difficult limitations to overcome.

This soil is in land capability subclass VI<sub>s</sub>.

# Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an

acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 24,000 acres in the survey area, or 12 percent of the total acreage, meets the requirements for prime farmland. Scattered areas of this land are throughout the county, but most are on flood plains and terraces. The largest areas are along the Cumberland River in general soil map unit 5.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."



# Use and Management of the Soils

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

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

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

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

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

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

## Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed for each

soil, the system of land capability classification used by the Natural Resources Conservation Service is explained, and the crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified.

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

About 104,000 acres, or about 52 percent of the acreage of Smith County, is used for hay and pasture. Corn, tobacco, and soybeans are the major row crops. The acreage of row crops varies from year to year and has been declining for the past several years. According to the 1987 Census of Agriculture, about 4,500 acres was planted to the three major crops, down from about 8,000 acres in 1982.

The dominant grass used for hay and pasture is tall fescue, followed by orchardgrass and bermudagrass. Improved pasture consists of white clover, red clover, or other legumes. In a few areas alfalfa or summer annual grasses are used for hay production. Most areas of pasture and hay are used in beef cattle operations.

Allocation of land for use as cropland, pasture, or woodland has been determined largely by land capability and by economic factors. Some land can be used only as woodland because of slope or rock outcrops. Other land usable as pasture or woodland is too steep for use as cropland. Land suitable for cropland is generally also suitable for pasture or woodland. Economic factors and personal values will influence decision makers on how to use land suitable for different purposes. Generally, most land suited to crops is used primarily for crops or is rotated with pasture or hay.

A limited amount of land is suitable for crop production in Smith County. Slope, rock outcrops, and depth to bedrock are the main limitations affecting the amount of potential cropland. If these limitations are severe, management practices will be unable to

overcome them. Land is limited to a grass or tree cover if it is too steep for row crops, has excessive rock outcrops, or is shallow over bedrock.

Other soil factors that limit plant growth include the amount and size of rock fragments, high clay content, wetness, and flooding. Rock fragments reduce available water capacity and interfere with tillage. High clay content limits available water capacity and, in the plow layer, affects tilth. Wetness delays planting in spring, limits plant growth, and can delay harvest.

Such crops as tobacco and alfalfa, which are sensitive to wetness, have severely reduced yields or will not grow at all, depending on the degree of wetness. Flooding can damage crops or result in the scouring of land. Most flooding in Smith County occurs in winter or early spring, but, during periods of intensive rainfall, some areas are subject to flooding at almost any time of the year.

Crops are produced mainly on flood plains and terraces of the Cumberland and Caney Fork Rivers and other smaller streams. In these areas the soils are generally deep and well drained, do not have excessive rock outcrops or fragments, and have high available water capacity. These soils are well suited to most crops grown in the survey area and, under good management, will produce high yields. Flooding is a hazard if crops are grown on flood plains. The probability of flooding depends on the local topography, the time of year, and the duration and extent of rainfall. The higher, more sloping soils on terraces are not subject to flooding, but, as slope increases, are subject to erosion.

In other parts of the county, such cultivated crops as tobacco and corn are grown on the bottom lands along small streams, on ridgetops, and on hilltops.

### **Cropland Management**

Because of slope, erosion is a significant management problem in many areas of the county. In large areas depth to bedrock, rock outcrops, and rock fragments in the soil are also serious problems. Management practices can be used to control soil erosion; however, very few management practices can be applied to overcome the other problems.

Erosion reduces soil productivity, results in siltation of stream channels, increases flooding on lowlands, and lowers the water quality in streams and lakes. Sediment from eroded fields carries pesticides and plant nutrients into streams.

Soil erosion reduces productivity in several ways. It reduces tilth and water infiltration and thus reduces seedling emergence and growth and makes cultivation more difficult. Reduced infiltration means less water enters the soil to be stored for plant use.

Available water capacity is reduced with the removal of the loamy surface layer, which holds the most water, and the subsoil, which has more clay. These problems are especially severe on soils that have limited depth to bedrock and already store less water.

Topsoil, plant nutrients, and organic matter are lost simultaneously. Replacing lost nutrients thus becomes an expense.

Conservation practices are effective in controlling erosion by reducing raindrop impact and slowing surface runoff. Vegetative practices include no-till, minimum tillage, crop residue management, cover crops, stripcropping, and sod-based rotation. These practices provide a ground cover that reduces raindrop impact and slows runoff. Mechanical practices include terraces, contour farming, and diversions. These practices reduce or slow runoff. Mechanical practices, such as terraces and diversions, which require movement of soil for construction, are best suited to deep soils that have uniform, smooth slopes of 12 percent or less. Information on the use of conservation practices is available from the local office of the Natural Resources Conservation Service.

Wetness can be a problem for crop production on individual farms, but it is not a major limitation in Smith County. Poorly drained Dowellton and Norene soils make up only about 400 acres. A few wet spots too small to map are included in better drained areas on the soil maps, where they are shown by the symbol for wet spots. Wet spot symbols indicate areas two drainage classes wetter than the mapped soil. On moderately well drained Egam, Lindell, and Paden soils, wetness does not seriously affect crops, except those sensitive to wetness, such as alfalfa and tobacco.

Poor tilth is a management problem in areas where erosion has removed most of the original surface soil and has exposed soil that is low in organic matter and higher in clay. Poor tilth makes tillage operations difficult, impedes seedling emergence and growth, and reduces water infiltration. Soil tilth can be maintained or improved by adding organic material and reducing the number of tillage operations. Organic material can be added by growing sod crops, managing crop residue, adding manure, or turning under green manure crops. Fresh organic material activates the organisms in the soil and improves soil structure, resulting in better tilth.

### **Soil Fertility**

Most soils in Smith County cannot produce sustained yields at an economically profitable level without the addition of plant nutrients. Nitrogen,

phosphorus, and potassium are the primary nutrients needed for plant growth. They are the elements most commonly added in commercial and organic fertilizers. They are taken up in crops, removed when the crops are harvested, and therefore must be replaced to maintain productivity.

The content of phosphorus and potassium depends on the natural content of these nutrients in the soil, their past removal in crops, and additions of fertilizer. Some soils in the outer part of the Nashville Basin are high in phosphorus because their parent rock contained phosphate nodules. Phosphorus and potassium can be built up, or stored, in the soil. Adding more phosphorus and potassium than is needed by the current crop may be feasible when their cost is lower than normal, but building them up to high levels generally is not practical. Soil tests can accurately determine if the soil needs additions of phosphorus and potassium.

Nitrogen is mobile in the soil. It is removed both by leaching and by crops. Organic matter can supply nitrogen. However, most soils in Smith County do not have an organic matter content high enough to supply nitrogen adequate to produce sustained yields at economically profitable levels in nonleguminous crops. Soil tests cannot predict nitrogen requirements. Recommendations for nitrogen applications from the results of soil tests for phosphorus and potassium are based on averages from research in similar climates with similar soils and the needs of the crop to be grown. Such legumes as soybeans and clover that can fix and use nitrogen from the air do not require nitrogen fertilizer.

Most of the soils in Smith County are acid throughout the major part of the root zone. When recently limed, the surface layer is normally less acid. Acidity affects the availability of nutrients and the activity of beneficial micro-organisms. For most plants the efficient uptake and use of nutrients requires a soil reaction (pH) of slightly acid to neutral. The optimum pH range depends on the particular crop. Soil tests determine pH and provide a basis for liming recommendations for the crop to be grown. The addition of the recommended amount of lime will achieve better results from fertilizer applications and will produce higher yields. Lime provides calcium; dolomitic lime also provides magnesium.

### **Pasture Management**

Pasture and hay make up a large land area in Smith County. Pasture and hay consist of both cool- and warm-season grasses and legumes. The main grasses are tall fescue, bermudagrass, and orchardgrass. The most common legumes are white

clover, red clover, alfalfa, annual lespedeza, and sericea lespedeza. Legume forages have a higher protein content than grasses and can supply available nitrogen, which reduces the need for nitrogen fertilizer. Including legumes in establishing pastures and reintroducing legumes into perennial grass stands when they make up less than about 30 percent of stands will optimize the quantity and quality of pastures.

Major pasture management practices include fertilization, liming, weed control, rotational grazing, and occasional renovation. As with crops, the desired level of forage production can be obtained by applying fertilizer and lime according to the results of soil tests. Weeds can be controlled by mowing before the weeds reach maturity and produce seed. Weed control is easier on well managed pasture than on overgrazed, poorly managed pasture. Proper stocking rates and rotation of livestock will help to maintain good stands and a dense cover of grasses and legumes.

Some annual grasses are used for supplemental grazing or for hay. Sudan-sorghum hybrids, pearl millet, and sudangrass make good summer pasture. Small grain and annual ryegrass provide good late fall and early spring grazing.

Hay is harvested from surplus growth of grass-legume pastures or from ungrazed fields used only for hay production. Grass-legume mixtures used for hay are similar to those used for pasture. Alfalfa, red clover, sericea lespedeza, annual lespedeza, and small grains are also used for hay crops. Management for hay is generally the same as for pasture, except that fertilizer recommendations are normally higher to produce a larger volume of forage. Hay crops should be cut at the stage of growth that provides the optimum quality and quantity of feed and does not damage the grass-legume stand. Cutting perennial hay crops too close will cause premature loss of the stand.

### **Yields per Acre**

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

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

The management needed to obtain the indicated

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

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

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

### Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (5). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

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

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use. There are no class V soils identified in Smith County.

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop, pasture, or woodland production. There are no class VIII soils identified in Smith County.

*Capability subclasses* are soil groups within on class. They are designated by adding a small letter, *e*, *w*, or *s*, to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class I there are no subclasses because the soils of this class have few limitations.

The capability classification of the map units in the survey area is given in the section "Detailed Soil Map Units" and in the yields table.

### Woodland Management and Productivity

Smith County, when first settled, was entirely forested. Gradually, most of the county was cleared for cropping. As the productive topsoil was eroded away on the steep hills, most of these steeper soils on hills were abandoned to grow up in grasses and trees. Woodland, all of which is privately owned, now occupies 81,000 acres, or about 40 percent of the total area of Smith County.

Woodland generally occupies the steeper slopes and dry ridges, which are unsuited to row crops and poorly suited to pasture. The composition of timber species that covers most woodland has changed little in the past 200 years. The forests still consist mainly of white oak, red oak, black oak, yellow-poplar, beech, maple, sweetgum, black gum, and hickory. Occasional, nearly pure stands of eastern redcedar generally grow in areas of shallow soils underlain by limestone bedrock.

Two-thirds of the woodland occurs on moderately

productive soils that have the potential to grow 250 to 450 board feet per acre per year. One-fourth of the woodland is capable of growing 450 to 600 board feet per acre per year. The rest has relatively low potential for timber production. Other woodland uses include wildlife habitat, recreation, esthetics, and conservation of soil, water, and air resources.

Soils vary in their ability to produce trees. Available water capacity and depth of the root zone have major effects on tree growth. Fertility and texture also influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Elevation and aspect are of particular importance in mountainous areas.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, some are more susceptible to landslides and erosion after roads are built and timber is harvested, and some require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about the suitability for forest land, the limitations affecting management of forest land, and the tree species suitable for planting. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight*, *moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions, *moderate* if erosion-control measures are needed for particular silvicultural activities, and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more

sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need for woodland managers to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic conditions. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, or bedrock or by a combination of such factors as wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them, *moderate* if strong winds cause an occasional tree to be blown over and many trees to break, and *severe* if moderate or strong winds commonly blow trees over. Ratings of moderate or

severe indicate that care is needed in thinning or that the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity of common trees* on a soil is expressed as a *site index* and as a *volume* number. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year calculated at the age of culmination of mean annual increment. Cubic feet can be converted to board feet by multiplying by a factor of about 5. For example, a volume of 114 means the soil can be expected to produce about 570 board feet per acre per year.

*Trees to plant* are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

## Recreation

The soils in Smith County generally are well suited to such recreational uses as picnic and playground areas, golf courses and sports areas, campgrounds, hunting areas, and vacation farms. The soils, climate, scenery, and water quality in the county collectively offer good potential for recreational development. The soil characteristics should not present a problem for development if careful consideration is given to soil depth, permeability, soil texture, slope, and drainage.

Streams and reservoirs formed from the runoff and ground water of the soils support good warmwater and coldwater fishing. Cordell Hull and Old Hickory Lakes provide numerous opportunities for water-based recreation. Among the public recreation areas that have been developed adjacent to these lakes are the Granville Recreation Area, the Horseshoe Bend State Recreation Area, the Cordell Hull Dam Site Recreation Area, and the Defeated Creek Recreation Area.

The natural, scenic, and historic areas of the county include the Col. Walton's Grave historical area, the Lover's Leap scenic area, the Potato Hill Overlook scenic area, the Pipers Cave natural area, and the Difficult-Defeated historical area.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

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

The information in the table can be supplemented

by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

*Camp areas* require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

*Picnic areas* are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

*Playgrounds* require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

*Paths and trails* for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

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

## Wildlife Habitat

Michael E. Zeman, biologist, Natural Resources Conservation Service, helped to prepare this section.

Smith County lies mostly within the Nashville Basin physiographic province. Small areas of the Highland

Rim physiographic province also extend into the county along its northern and eastern boundaries. Most of the county is hilly and steep. The soils range from shallow and clayey over limestone to deep and loamy over siltstone. See the section "General Soil Map Units" for a description of the major soils in the county. The climax plant community is the oak-hickory forest type, which is dominated by shagbark hickory, southern red oak, eastern redcedar, hackberry, and Osage-orange. The typical site is brushy. The understory species commonly include honeysuckle, coralberry, and greenbrier.

Wildlife is an important natural resource of the county. It provides a source of revenue from hunting. Popular game species include bobwhite quail, cottontail rabbit, whitetail deer, mourning dove, eastern wild turkey, and gray and fox squirrels. The wildlife in the county provides recreational opportunities for photography and bird-watching and improves the overall quality of life.

The whitetail deer is the most popular game animal in the county. The herd has grown from almost nonexistent in the 1940's to about 1 deer per 20 to 40 acres across the county in the mid-1980's. In several small, local areas the herd is even more populous. The largest populations are in the northeastern part of the county, north of Cordell Hull Lake, where the more extensive woodland in the county is interspersed with openland. The deer herd has expanded largely as a result of restoration activities of the Tennessee Wildlife Resources Agency and effective game management. Smith County is one of the top 10 deer-producing counties in Tennessee. By the late 1980's, it had annual harvests of about 2,000 deer. The deer populations in the county are basically stable because of a minimal conversion of land use and because much of the habitat is at carrying capacity.

The eastern wild turkey population in the county declined to zero and remained there from the early 1950's until as late as 1983. However, the Tennessee Wildlife Resources Agency has successfully stocked nucleus flocks. Although populations are not yet huntable in the county, turkeys are increasing in numbers and expanding their range.

The bobwhite quail population is good in the agricultural areas of the county. The highest numbers of bobwhite quail inhabit the northwestern part of the county, along the Cumberland River and Peyton Creek. On uplands and on first bottoms and terraces, the habitat is diverse where brushy fence rows, odd areas, and idle fields are adjacent to cropland and woodland edges. The bobwhite quail population is down from several years ago, but it is stable because cropland has been converted to grassland.

The cottontail rabbit population is good throughout the county. The highest numbers are along the Cumberland and Caney Fork Rivers and within the 25,000-acre Cordell Hull Wildlife Management Area. In these areas agricultural lands combined with abundant, low, brushy cover and idle grassland provide optimum habitat. The cottontail rabbit population is stable, but down from several years ago, when small family farms provided more interspersed cropland and idle areas as habitat.

Mourning dove is the most popular migratory game bird in the county. The dove, in relatively good numbers, annually migrates through the county. The highest numbers frequent bottom lands planted to grain crops. The dove population has been down slightly for the past 20 years, but remains stable.

Three species of squirrels inhabit the county. The nocturnal southern flying squirrel is common, but not often visible. Gray squirrel and fox squirrel are also very common. Good or excellent populations of gray squirrels are throughout the county. The highest numbers live in the eastern half of the county, which has the larger expanses of hardwood forest habitat in the county. Good populations of fox squirrel also are throughout the hardwood forest habitat. The highest numbers live along woodland edges, in the smaller woodlots, and in woody fence rows near agricultural fields.

Waterfowl numbers are low in the county, which lies outside the Mississippi Flyway. The highest numbers of waterfowl in the county are on Cordell Hull Lake, within the Cordell Hull Wildlife Management Area, where creek embayments and shallow backwater areas create excellent, late-season feeding and resting areas. The most prominent species of ducks that overwinter in the county are mallard, wood duck, blue-wing teal, goldeneye, scaup, and bufflehead. To a lesser degree, waterfowl also use the many ponds scattered throughout the county. In spring some wood ducks nest in any suitable nesting cavities.

Several species of furbearers inhabit the county. Wetland furbearers include mink, muskrat, and beaver. Although very few wetlands are in the county, good numbers of mink and muskrat are along the Cumberland River and near farm ponds and Cordell Hull Lake. Populations of beaver are low along the more sluggish tributary streams entering Cordell Hull Lake. The wetland furbearer populations are stable. Upland furbearers are abundant throughout the county. Those species include eastern bobcat, opossum, raccoon, gray and red foxes, and striped and spotted skunks. Coyote inhabited the county during the 1970's, when it extended its range from the

west. It is now abundant throughout the county, and the coyote population continues to grow.

Nongame species are abundant throughout the county. Different species of birds are associated with different plant communities. Common songbirds include eastern bluebird and purple martin, which are frequently encouraged to nest around farmsteads. Woodland birds include Carolina chickadee, tufted titmouse, pileated woodpecker, and wood thrush. Openland birds include robins, meadowlarks, and various sparrows. Some of the more beautiful birds, such as cardinals, indigo buntings, and yellow-breasted chats, inhabit early successional weed and shrub plant communities. The common birds of prey include the red-tailed hawk, sparrow hawk, barred owl, and screech owl.

The common reptiles and amphibians include snapping turtle, red ear turtle, and eastern box turtle; five-lined skink; eastern hognose snake and copperhead snake; bullfrogs; and dusky salamander. The common mammals include Hispid cotton rat, voles, moles, and other small rodents.

The relative abundance of nongame species depends upon the type and quality of habitat for individual species. Generally, management for game species improves the quality of the habitat for most nongame species.

State and Federal lists of threatened or endangered wildlife species that may inhabit Smith County include gray bat, nine species of freshwater mussels, lake sturgeon, Eastern cougar, river otter, blue sucker, and northern pine snake. Mussels, lake sturgeon, and blue sucker inhabit the Cumberland River. River otter inhabits the Cumberland and Caney Fork Rivers and Cordell Hull Lake. Migratory species include bald eagle, peregrine falcon, osprey, sharp-shinned hawk, Cooper's hawk, and grasshopper sparrow. Bald eagle and osprey live near Cordell Hull Lake.

Most soils in Smith County have moderate or severe limitations as sites for ponds because of seepage and depth to bedrock. Nevertheless, the county has several soils suitable for impounding water and consequently is dotted with ponds and small lakes. Many ponds are stocked for recreational fishing with such species as largemouth bass, bluegill sunfish, redear sunfish, channel catfish, and fathead minnows. Occasionally, the larger lakes are stocked with white and black crappie. Ponds typically have acidic water, which reduces fish production. Most ponds are unmanaged and produce from 50 to 100 pounds per acre of fish annually. Limed, fertilized, and managed bass ponds have an annual production of up to about 300 pounds per acre. The largest lake in the

county, Cordell Hull Lake, is a 13,920-acre public reservoir built and managed by the U.S. Army Corps of Engineers. Popular sport fish in the reservoir include largemouth and smallmouth bass, black and white crappie, channel and flathead catfish, bluegill and redear sunfish, white bass, walleye, sauger, and striped bass.

Smith County has a total of 168 miles of warmwater streams, which provide about 2,388 acres of aquatic habitat. The largest of these is the Cumberland River, which ranges to a width of about 300 feet and extends east to west through the central part of the county. The common fish species inhabiting the streams of the county include largemouth bass, smallmouth bass, spotted bass, rock bass, bluegill sunfish, longear sunfish, green sunfish, channel catfish, flathead catfish, brown and yellow bullheads, and several species of redhorse suckers and minnows. The Caney Fork River receives cold water from the Center Hill Dam, located southeast of the county; the Caney Fork supports not only many of the aforementioned warmwater species but also rainbow trout, with which it is periodically stocked. The streams throughout the county are moderately productive and have good populations of warmwater fishes. The 305(b) report on the status of water quality in Tennessee, issued by the Tennessee Department of Health and Environment, indicates no restrictions to aquatic use on the streams or on Cordell Hull Lake in Smith County.

Very little warmwater or coldwater aquaculture takes place in Smith County. The county has a moderately long growing season and an average annual rainfall of more than 50 inches. Several soils, including Dowellton, Egam, Norene, and Paden soils, are suited to ponds. However, the overall steep terrain of the county limits the availability of suitable sites for extensive aquaculture. Adequate volumes of ground water for aquaculture are at a restrictive depth. The Central Basin Aquifer yields some coldwater springs, but most of the aquifer is in water-bearing strata at a depth of as much as 300 feet. Yields range from 0 to 100 gallons of water per minute. The water generally is of good quality. It contains less than 500 parts per million of dissolved solids.

Smith County has very few wetlands, excluding such artificial wetlands as upland ponds and Cordell Hull Lake. The wetlands are mainly wooded on Norene soils on low stream terraces, in depressions, and at the head of drainageways. These soils have a high water table and collect water in small depressions during wet periods. Wetlands are most commonly along the Cumberland and Caney Fork Rivers. Bottom land hardwoods provide some of the most productive wildlife habitat in the county. Many upland and wetland

wildlife species depend on wooded wetlands for their daily needs. The highly productive soils on bottom lands generally provide the best mast and forage production for wildlife. Bottom land hardwoods improve the water quality of streams; they remove nutrients and trap sediment from upland runoff; they shade water and lower its temperature; and they provide leaf litter, which feeds aquatic insects, the primary food source of small fish.

Habitat management provides adequate amounts of food, needed cover types, and water within the home range of wildlife. The lack of any one of these needs, an unfavorable balance among them, or an inadequate distribution of them can curtail or eliminate an animal population. For example, whitetail deer feed on weeds, fruits, acorns, leaves, twigs, and seeds. In Smith County a typical area of woodland habitat provides some of these food items on a seasonal basis but fails to provide quality food throughout the year. Creating small openings on soils where potential timber production is low increases the edge habitat and provides winter weeds that normally are lacking. Planting linear food plots on suitable soils further supplements seasonal food. Woodland habitat provides cover for deer but may not provide various other cover types, such as nesting and shrubby winter and escape cover, for turkey and quail. The desired cover plants may need to be established.

Conservation practices can improve or provide quality wildlife habitat. On cropland, planned crop rotations and crop residue management can provide food and needed winter cover for many species of songbirds, quail, dove, turkey, rabbits, and deer. Deferred grazing by livestock and fencing can protect food plots, browse plants for deer, nesting cover for quail and turkey, and even fish habitat. Field borders and filter strips along streams bordering cropland or pasture can protect the water quality of streams and provide food, cover and travel lanes for quail, deer, squirrels, turkey, rabbits, songbirds, and many other nongame species. Field borders of shrubs or tall grass on improved pasture benefit quail, deer, turkey, rabbits, and many nongame species. Selective thinning of woodland can improve wildlife habitat while protecting den and quality mast-producing trees.

Other practices can also improve wildlife habitat. They include upland wildlife habitat management, wetland wildlife habitat management, management of fish ponds, grasses and legumes in rotation, nutrient management, pasture and hay planting, pasture and hay management, ponds, strip disking, tree planting, livestock exclusion, and woodland improvement.

Some practices are harmful to wildlife. The most common ones include indiscriminate burning and use

of chemicals to kill weeds and insects, heavy grazing, clean mowing early in the growing (nesting) season, clean fall plowing, extensive clearcutting of timber, draining wetlands, and removing den and mast-producing trees.

Technical assistance in planning or applying these conservation and wildlife management practices can be obtained from the Natural Resources Conservation Service, the University of Tennessee Agricultural Extension Service, the Tennessee Wildlife Resources Agency, and the Tennessee Division of Forestry.

Plant diversity affects the overall biodiversity of an area by determining the diversity of wildlife populations. Environmental factors, such as soils, rainfall distribution, land use, and management, determine the plant diversity in any given area of the county. In general, the more diverse the soil types and plant communities of an area, the higher the biodiversity.

Soils affect the kind and amount of vegetation available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Planting the appropriate vegetation, maintaining existing plant cover, or promoting natural establishment of desirable plants can create or improve wildlife habitat.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

## Elements of Wildlife Habitat

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

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

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

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

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

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

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

### **Habitat for Various Kinds of Wildlife**

*Habitat for openland wildlife* consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, meadowlark, field sparrow, cottontail, and red fox.

*Habitat for woodland wildlife* consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, barred owl, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and coyote.

*Habitat for wetland wildlife* consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

## **Engineering**

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

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

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

Government ordinances and regulations that restrict certain land uses or impose specific design

criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

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

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

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

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

### **Building Site Development**

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is

needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

*Dwellings and small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrinking and swelling can cause the movement of footings. A high water table, depth to bedrock, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

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

*Lawns and landscaping* require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, and the available water capacity in the upper

40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

### Sanitary Facilities

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

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

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

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

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the

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

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

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

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

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

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

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

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that

are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

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

### Construction Materials

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

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

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

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

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less.

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

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

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

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

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of

soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

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

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

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

### Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

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

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings

apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

*Drainage* is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, subsidence of organic layers, and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur.

Availability of drainage outlets is not considered in the ratings.

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

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

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



# Soil Properties

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

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

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

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

## Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

*Depth* to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

*USDA texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and

less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the Unified soil classification system (2) and the system adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

*Rock fragments* 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit and plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

## Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at  $\frac{1}{3}$ -bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

*Permeability* refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity,

and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Soil reaction* is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, more than 9 percent.

*Erosion factor K* indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil

structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

## Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious

material. These soils have a very slow rate of water transmission.

*Flooding*, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes or in closed depressions is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

*High water table* (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is

allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

*Depth to bedrock* is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

*Risk of corrosion* pertains to potential soil-induced

electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (6). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, thermic Typic Hapludalfs.

**SERIES.** The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Talbott series.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (8). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (6) and in "Keys to Soil Taxonomy" (7). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

### Armour Series

The Armour series consists of very deep, well drained soils. These soils formed in silty alluvium on stream terraces and in colluvium on foot slopes. Slopes range from 2 to 20 percent.

Typical pedon of Armour silt loam, 5 to 12 percent slopes, eroded; 5.7 miles north of U.S. Highway 70N at Chestnut Mound on Sullivan's Bend Road, east on

field road 0.2 mile to large hackberry tree, northeast of tree:

- Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.
- BA—6 to 10 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; many fine roots; moderately acid; clear smooth boundary.
- Bt1—10 to 18 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; few distinct clay films on faces of peds; moderately acid; gradual smooth boundary.
- Bt2—18 to 33 inches; brown (7.5YR 4/4) silty clay loam; few medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds; common black streaks and nodules; moderately acid; gradual smooth boundary.
- Bt3—33 to 50 inches; yellowish red (5YR 4/6) silty clay loam; few medium distinct light yellowish brown (10YR 6/4) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films; 5 percent rock fragments 1 inch or less in diameter; moderately acid; gradual smooth boundary.
- Bt4—50 to 63 inches; yellowish red (5YR 4/6) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; 5 percent rock fragments 1 inch or less in diameter; moderately acid; gradual smooth boundary.
- BC—63 to 72 inches; yellowish red (5YR 4/6) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; friable; few fine roots; moderately acid.

Depth to bedrock is more than 60 inches. Content of gravel ranges from 0 to 10 percent in all horizons. Map units on terraces of larger streams generally are less gravelly than map units on foot slopes and terraces along small drainageways. Reaction is strongly acid or moderately acid.

The A horizon has hue of 10YR, value of 3, and chroma of 2 to 4. The texture is silt loam.

Some pedons have a BA horizon.

The Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it has mottles in shades of yellow, brown, or red. The texture is silty clay loam or silt loam.

The BC and C horizons, where present, have the same range of colors as those in the Bt horizon. They are silty clay loam or silt loam. Some pedons have a 2Bt, 2BC, or 2C horizon, which is silty clay or clay.

## Arrington Series

The Arrington series consists of very deep, well drained soils. These soils formed in silty alluvium on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Arrington silt loam, occasionally flooded; 2.6 miles east of intersection of U.S. Highway 70N and Tennessee Highway 53, north on farm road 0.9 mile to cross fence, 300 yards northwest of fence:

- Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; many fine and medium roots; slightly acid; gradual smooth boundary.
- A—9 to 27 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure; friable; common fine roots; slightly acid; gradual smooth boundary.
- Bw1—27 to 40 inches; dark yellowish brown (10YR 3/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; slightly acid; neutral; gradual smooth boundary.
- Bw2—40 to 60 inches; dark yellowish brown (10YR 3/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; slightly acid.

Depth to bedrock is more than 60 inches. Content of gravel is less than 5 percent in the solum and ranges from 0 to 15 percent in the C horizon. Rock fragments are most abundant in those map units on flood plains of small streams. Reaction ranges from slightly acid to slightly alkaline.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. The texture is silt loam.

The Bw horizon has hue of 10YR, value and chroma of 3 or 4. The texture is silt loam or silty clay loam. In some pedons the lower part of the Bw horizon is mottled in shades of brown.

The C horizon has hue of 10YR, value of 4, and chroma of 3 or 4. The texture is silt loam, silty clay loam, or loam. Typically, the horizon has mottles in shades of brown.

## Ashwood Series

The Ashwood series consists of moderately deep, well drained soils that have a clayey subsoil. These soils formed in residuum derived from limestone on hills and ridges in the outer part of the Nashville Basin. Slopes range from 5 to 45 percent.

Typical pedon of Ashwood silt loam, in an area of Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes; 0.2 mile west of the Carthage city limits on Tennessee Highway 25, north of highway 1,200 feet along streambed, west 200 feet up the hillside:

- A—0 to 8 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; common fine and medium and few coarse roots; 5 percent limestone channers up to 6 inches in diameter; slightly acid; clear smooth boundary.
- Bt1—8 to 13 inches; dark brown (10YR 3/3) silty clay loam; moderate fine subangular blocky structure; friable; common fine and medium and few coarse roots; 5 percent limestone channers up to 6 inches in diameter; common distinct very dark grayish brown (10YR 3/2) clay films on faces of ped; slightly acid; clear smooth boundary.
- Bt2—13 to 23 inches; dark yellowish brown (10YR 4/4) clay; strong medium subangular blocky structure; firm; few coarse, medium, and fine roots; 5 percent limestone channers and flagstones up to 20 inches in diameter; common distinct dark yellowish brown (10YR 4/4) clay films on faces of ped; slightly acid; clear smooth boundary.
- Bt3—23 to 31 inches; yellowish brown (10YR 5/6) clay; common medium distinct strong brown (7.5YR 4/4) and light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; firm; 30 percent limestone flagstones 6 to 24 inches in diameter; common faint clay films on faces of ped; slightly acid; abrupt irregular boundary.
- R—31 inches; hard limestone bedrock.

Depth to limestone bedrock ranges from 20 to 40 inches. Content of limestone channers and flagstones or chert fragments ranges from 5 to 15 percent. Reaction ranges from moderately acid to slightly alkaline.

The A horizon has hue of 10YR, value and chroma of 2 or 3. The texture is silt loam or silty clay loam.

The Bt horizon generally has hue of 10YR, 7.5YR, or 2.5Y; value of 4 or 5; and chroma of 4 or 6. In some pedons the lower part of the Bt horizon has mottles in shades of brown and gray. In some pedons the mollic epipedon extends into the upper part of the Bt horizon. In these pedons the upper part of the Bt horizon has

colors similar to those of the A horizon. The Bt horizon is silty clay or clay. In some pedons the upper part of the Bt horizon is silty clay loam.

The BC or C horizon, where present, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. It has few to many mottles in shades of brown and gray. The texture is silty clay or clay.

## Barfield Series

The Barfield series consists of shallow, well drained soils on hills and ridges. These soils formed in clayey residuum derived from limestone. Slopes range from 5 to 70 percent.

Typical pedon of Barfield silty clay loam, in an area of Barfield-Ashwood-Rock outcrop complex, 20 to 70 percent slopes; 1.5 miles northwest of Highway 80 at Pleasant Shade on Little Creek Road, northeast 0.25 mile into woods:

- A—0 to 4 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate medium granular structure; friable; many fine and medium roots; few limestone channers and flags; slightly acid; clear smooth boundary.
- Bw1—4 to 11 inches; dark brown (10YR 3/3) silty clay; strong fine angular blocky structure; firm; common fine and medium roots; few limestone channers and flags; neutral; gradual smooth boundary.
- Bw2—11 to 14 inches; brown (10YR 4/3) flaggy clay; strong medium angular blocky structure; firm; common fine and medium roots; 20 percent, by volume, limestone channers and flags; slightly alkaline.
- R—14 inches; hard limestone bedrock.

Depth to limestone bedrock ranges from 8 to 20 inches. Content of flat limestone fragments ranges from 5 to 15 percent in the A horizon and from 5 to 25 percent in the B and C horizons. Reaction ranges from slightly acid to slightly alkaline.

The A horizon has hue of 10YR, value and chroma of 2 or 3. The texture is silty clay loam or silty clay.

The Bw horizon has hue of 10YR or 2.5Y, value and chroma of 2 to 4. Value and chroma of 4 occurs in the lower part of the Bw horizon. In many pedons the mollic epipedon extends into the Bw horizon. The texture of the fine earth fraction is silty clay or clay.

The R layer is hard limestone bedrock.

## Bradyville Series

The Bradyville series consists of deep, well drained soils that formed in clayey residuum derived from limestone. These soils are on uplands in the inner part

of the Nashville Basin in the western part of the county. Slopes range from 2 to 12 percent.

Typical pedon of Bradyville silt loam, 2 to 5 percent slopes, eroded; 200 feet north of Alexandria sewage treatment plant, east of Tennessee Highway 53 near the DeKalb County line:

- Ap—0 to 6 inches; dark brown (7.5YR 3/4) silt loam; weak fine granular structure; very friable; 5 percent chert fragments up to 1 inch in diameter; many fine roots; moderately acid; abrupt smooth boundary.
- Bt1—6 to 15 inches; yellowish red (5YR 4/6) silty clay loam; many medium distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; many fine roots; strongly acid; clear smooth boundary.
- Bt2—15 to 22 inches; yellowish red (5YR 4/6) silty clay; few medium distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; many distinct clay films on faces of peds; common fine roots; strongly acid; clear smooth boundary.
- Bt3—22 to 30 inches; yellowish red (5YR 4/6) clay; few medium distinct strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; 10 percent chert fragments up to 2 inches in diameter; many distinct clay films on faces of peds; few fine roots; few black stains; strongly acid; clear smooth boundary.
- Bt4—30 to 40 inches; red (2.5YR 4/6) clay; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; very firm; many faint clay films on faces of peds; common black stains; strongly acid; gradual wavy boundary.
- BC—40 to 48 inches; yellowish red (5YR 4/6) clay; many medium distinct red (2.5YR 4/6) and strong brown (7.5YR 5/6) mottles; weak medium angular blocky structure; very firm; common black stains; neutral.
- R—48 inches; limestone bedrock.

Depth to bedrock is 40 to 60 inches. In all horizons content of chert or other rock fragments ranges from 0 to 15 percent. Reaction ranges from strongly acid to neutral.

The A horizon has hue of 10YR, value and chroma of 3 or 4. Where value and chroma are 3, the horizon is less than 6 inches thick. The texture is silt loam.

The Bt horizon has hue of 5YR or 2.5YR, and in the upper few inches it includes 7.5YR. It has value of 4 or 5 and chroma of 4 or 6. Some pedons have few to many mottles in shades of brown, yellow, and red. The texture is clay or silty clay.

The BC or C horizon, where present, has the same colors and textures as those in the Bt horizon.

## Braxton Series

The Braxton series consists of very deep, well drained soils that formed in old, clayey alluvium or valley fill over limestone residuum or limestone bedrock. These soils are on hillsides along the Cumberland and Caney Fork Rivers. Slopes range from 5 to 20 percent.

Typical pedon of Braxton gravelly silt loam, 12 to 20 percent slopes, eroded; 3.7 miles south of Tennessee Highway 25 on Rome (Beasley's Bend) Road, 150 feet west, in pasture

- Ap—0 to 6 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; moderate medium granular structure; friable; common fine roots; 20 percent rounded sandstone and chert fragments up to 2 inches in diameter; neutral; abrupt smooth boundary.
- Bt1—6 to 23 inches; strong brown (7.5YR 5/6) clay; strong medium subangular blocky structure; firm; few fine roots; 10 percent rounded sandstone and chert fragments up to 2 inches in diameter; common faint clay films on faces of peds; slightly acid; gradual smooth boundary.
- Bt2—23 to 36 inches; strong brown (7.5YR 5/6) clay; many medium distinct strong brown (7.5YR 5/8) and common medium distinct light brown (7.5YR 6/4) and yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; 10 percent rounded sandstone and chert fragments up to 2 inches in diameter; many distinct clay films on faces of peds; strongly acid; gradual smooth boundary.
- Bt3—36 to 55 inches; strong brown (7.5YR 4/6) clay; many medium distinct yellowish red (10YR 4/6) and common medium distinct very pale brown (10YR 7/3) mottles; weak fine subangular blocky structure; very firm; 10 percent rounded sandstone and chert fragments up to 2 inches in diameter; common faint clay films on faces of peds; strongly acid; gradual smooth boundary.
- Bt4—55 to 60 inches; strong brown (7.5YR 4/6) clay; many coarse distinct very pale brown (10YR 7/3) and common medium distinct yellowish brown (10YR 5/8) mottles; weak medium angular blocky structure; firm; 5 percent rounded sandstone and chert fragments up to 2 inches in diameter; common faint clay films on faces of peds; strongly acid.

Depth to bedrock is more than 60 inches. Content

of rock fragments ranges from 15 to 30 percent in the A horizon and from 5 to 15 percent in the B horizon. Reaction ranges from strongly acid to slightly acid.

The A horizon has hue of 10YR, value and chroma of 3 or 4. In pedons that have value and chroma of 3, it is less than 7 inches thick. The texture is gravelly silt loam.

The Bt horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it has few to many mottles in shades of brown, yellow, and red. The texture is clay or silty clay. In some pedons the texture is silty clay loam in the upper part of the Bt horizon.

The C horizon, where present, has the same colors and textures as those in the Bt horizon.

### Dellrose Series

The Dellrose series consists of very deep, well drained soils formed in colluvium derived from cherty limestone. These soils are on concave side slopes and benches below convex hilltops and steep side slopes. Slopes range from 4 to 60 percent.

Typical pedon of Dellrose gravelly silt loam, 20 to 60 percent slopes; north 3,000 feet on Enigma Road from U.S. Highway 70N to the first sharp curve, northwest on field road to barn, 500 yards north of barn on dirt road to end of road, 50 feet southwest:

Ap—0 to 9 inches; dark brown (7.5YR 3/2) gravelly silt loam; weak fine granular structure; very friable; many fine roots; 25 percent fragments of chert up to 5 inches in diameter; strongly acid; gradual wavy boundary.

BA—9 to 18 inches; brown (7.5YR 4/4) gravelly silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots; 25 percent fragments of chert up to 5 inches in diameter; strongly acid; gradual smooth boundary.

Bt1—18 to 30 inches; brown (7.5YR 4/4) gravelly silty clay loam; moderate medium subangular blocky structure; friable; common fine and medium roots; 25 percent fragments of chert up to 5 inches in diameter; few faint clay films on faces of peds and on chert fragments; strongly acid; gradual wavy boundary.

Bt2—30 to 50 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; few medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few medium roots; 20 percent fragments of chert up to 3 inches in diameter; few faint clay films on faces of peds and on chert fragments; strongly acid; gradual wavy boundary.

Bt3—50 to 68 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; common medium distinct yellowish red (5YR 6/3), light yellowish brown (10YR 6/4), and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; 20 percent fragments of chert and siltstone up to 3 inches in diameter; few faint clay films on faces of peds; strongly acid.

Depth to bedrock is more than 60 inches. Content of angular coarse fragments ranges from 15 to 35 percent in all horizons. Rock fragments are mostly chert gravel. In some pedons they are 0 to 10 percent cobbles. Reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR or 7.5YR, value of 3, and chroma of 2 or 3. The texture is gravelly silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons it has mottles in shades of brown, red, and yellow. The texture of the fine earth fraction is silt loam or silty clay loam.

Some pedons have a 2Bt or 2BC horizon. The colors are the same as those in the Bt horizon. The texture is silty clay loam, clay, or silty clay.

### Dowellton Series

The Dowellton series consists of deep, poorly drained soils. These soils formed in residuum derived from limestone or in old, clayey alluvium underlain by limestone. They are in depressions on uplands, on benches, or on terraces. Slopes range from 1 to 4 percent.

Typical pedon of Dowellton silty clay loam, 1 to 4 percent slopes; 0.9 mile south of Tennessee Highway 53/141 on Dry Fork Road, west 2,100 feet on driveway to pond, 50 feet south of pond:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; few cracks 0.5 to 1 inch wide; friable; many fine roots; slightly acid; clear smooth boundary.

E—4 to 10 inches; gray (10YR 5/1) silty clay loam; many medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few cracks 0.5 to 1 inch wide; moderately acid; clear wavy boundary.

Btg1—10 to 18 inches; light brownish gray (10YR 6/2) clay; many medium prominent yellowish red (5YR 4/6) and many medium distinct light gray (10YR 7/1) and light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; firm,

sticky and plastic; few fine roots; few faint clay films on faces of peds; few cracks 0.5 to 1 inch wide; very strongly acid; gradual wavy boundary.

Btg2—18 to 30 inches; light gray (10YR 7/2) clay; many medium prominent yellowish red (5YR 4/6) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine roots; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—30 to 44 inches; light gray (10YR 7/1) clay; many medium prominent yellowish red (5YR 4/6) and distinct gray (10YR 6/1) mottles; massive; firm, sticky and plastic; few rock fragments; strongly acid.

R—44 inches; hard limestone bedrock.

Depth to bedrock ranges from 40 to 60 inches. In most years these soils have cracks 0.5 to 1 inch wide to a depth of 20 inches or more. Reaction ranges from strongly acid to neutral.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The texture is silty clay loam or silt loam.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. In some pedons it has mottles in shades of brown and gray. In some pedons it has been incorporated into the Ap horizon. The texture is silty clay loam or silt loam.

The Btg horizon has hue of 10YR or 2.5Y. It has value of 6 or 7 and chroma of 1 or 2 or value of 4 or 5 and chroma of 1. In many pedons it has mottles in shades of red, brown, and yellow. The texture is clay or silty clay.

Many pedons have a BCg or Cg horizon, which has the same colors and textures as those in the Btg horizon.

## Egam Series

The Egam series consists of very deep, moderately well drained soils. These soils formed in clayey alluvium on flood plains. Slopes range from 0 to 3 percent.

Typical pedon of Egam silt loam, occasionally flooded; 1.6 miles west of Tennessee Highway 264 on Hickman-Brush Creek Road, southeast on field road to railroad, 50 feet southeast of railroad track:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; many fine roots; slightly acid; clear smooth boundary.

A—7 to 23 inches; very dark grayish brown (10YR 3/2)

silty clay loam; moderate medium subangular blocky structure; firm; many fine roots; slightly acid; gradual smooth boundary.

Bw1—23 to 45 inches; dark brown (10YR 3/3) silty clay; few fine faint grayish brown (10YR 5/2) mottles; strong medium angular blocky structure; very firm; common fine roots; common black and brown nodules; slightly acid; gradual smooth boundary.

Bw2—45 to 57 inches; brown (10YR 4/3) silty clay; common fine faint grayish brown (10YR 5/2) mottles; strong medium angular blocky structure; very firm; few fine roots; common black and brown nodules; slightly acid; gradual smooth boundary.

Bw3—57 to 65 inches; brown (10YR 4/3) silty clay; common fine faint grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; firm; common black and brown nodules; neutral.

Depth to bedrock is more than 60 inches. Reaction ranges from moderately acid to neutral.

The Ap and A horizons have hue of 10YR, value and chroma of 2 or 3. In some pedons the lower part of the A horizon has mottles in shades of gray or brown. The texture is dominantly silt loam, but in some pedons it is silty clay loam.

The Bw horizon generally has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. In many pedons the mollic epipedon extends into the Bw horizon. In these pedons the upper part of the Bw horizon has the same colors as those in the A horizon. In some pedons the Bw horizon has mottles in shades of gray or brown. The texture is silty clay, clay, or silty clay loam.

The C horizon, where present, has the same colors as those in the Bw horizon or is mottled without a dominant matrix color. The texture is the same as that in the Bw horizon.

## Hampshire Series

The Hampshire series consists of deep, well drained soils. These soils formed in clayey residuum derived from interbedded limestone and siltstone on uplands in the outer part of the Nashville Basin. Slopes range from 2 to 25 percent.

Typical pedon of Hampshire silt loam, 5 to 12 percent slopes, eroded; 3.9 miles south of Tennessee Highway 25 on Rome (Beasley's Bend) Road, east of road 150 feet, 200 feet west of Cumberland River bluff, in pasture:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many

- fine roots; about 5 percent thin, flat fragments of soft siltstone 1 inch or less in diameter; neutral; clear wavy boundary.
- BA—6 to 10 inches; dark yellowish brown (10YR 4/6) silt loam; moderate medium and fine subangular blocky structure; friable; many fine roots; about 5 percent thin, flat fragments of soft shale and siltstone 1 inch or less in diameter; neutral; clear smooth boundary.
- Bt1—10 to 16 inches; dark yellowish brown (10YR 4/6) clay; moderate medium and fine subangular blocky structure; friable; common fine roots; common faint clay films on faces of peds and on fragments; about 5 percent soft fragments 2 inches or less in diameter; strongly acid; gradual smooth boundary.
- Bt2—16 to 24 inches; strong brown (7.5YR 4/6) clay; few fine distinct light yellowish brown (2.5Y 6/4) mottles (fragments of highly weathered parent material); strong medium subangular blocky structure; firm; common fine roots; many distinct dark brown (7.5YR 4/4) clay films on faces of peds and on fragments; about 10 percent soft fragments 1 to 4 inches in diameter; strongly acid; gradual smooth boundary.
- Bt3—24 to 30 inches; strong brown (7.5YR 4/6) clay; common medium distinct light yellowish brown (2.5Y 6/4) and reddish brown (5YR 4/4) mottles (consisting primarily of soft parent material); moderate medium subangular blocky structure; firm; common distinct dark brown (7.5YR 4/4) clay films on faces of peds and on fragments; about 15 percent soft, rectangular siltstone fragments 1 to 4 inches in diameter, organized in weak, horizontal bedding planes; strongly acid; clear smooth boundary.
- BC—30 to 37 inches; strong brown (7.5YR 4/6) channery clay; common medium distinct light yellowish brown (2.5Y 6/4) and reddish brown (5YR 4/4) mottles (consisting primarily of soft parent material); moderate medium angular blocky structure parting to platy, firm; few faint clay films on faces of peds and on fragments; about 20 percent, by volume, soft rectangular siltstone fragments 1 to 6 inches in diameter in discontinuous, horizontal bedding planes; few hard siltstone and sandstone flagstones; very strongly acid; gradual smooth boundary.
- C—37 to 49 inches; strong brown (7.5YR 4/6) very channery silty clay loam; many medium distinct light yellowish brown (2.5Y 6/4) and reddish brown (5YR 4/4) mottles; about 50 percent thinly bedded and fractured soft siltstone that crushes to silt loam; some harder flagstones that cannot be

crushed; very strongly acid; gradual smooth boundary.

- Cr—49 to 60 inches; interbedded siltstone and shale with thin bands of silty clay loam, in interstices between rock layers.

Depth to bedrock ranges from 40 to 60 inches. Fragments of siltstone and fine-grained sandstone range from 0 to 15 percent in the A and Bt horizons and from 15 to 50 percent in the BC and C horizons. Reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4. The texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons the middle and lower parts of the Bt horizon are mottled in shades of brown and yellow. The texture is clay, silty clay, or silty clay loam. Some pedons have texture of clay loam.

The C or BC horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. Many pedons are mottled in shades of yellow and brown. The fine earth fraction is silty clay loam, silty clay, silt loam, or loam.

The Cr horizon is interbedded, highly weathered siltstone and limestone.

## Hawthorne Series

The Hawthorne series consists of moderately deep, somewhat excessively drained soils. These soils formed in residuum derived from cherty limestone and siltstone. They are on upland hillsides and convex ridgetops that are remnants of the Highland Rim in highly dissected areas of the outer part of the Nashville Basin. Slopes range from 5 to 60 percent.

Typical pedon of Hawthorne gravelly silt loam, 5 to 20 percent slopes; 300 feet north of intersection of Green Hollow and Dean Hill Roads on Green Hollow Road, 10 feet west of road:

- Ap—0 to 9 inches; brown (10YR 5/3) gravelly silt loam; weak fine granular structure; very friable; many fine roots; 25 percent chert fragments up to 3 inches in diameter; strongly acid; clear smooth boundary.
- Bw1—9 to 16 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; weak fine subangular blocky structure; friable; many fine roots; 25 percent chert fragments up to 3 inches in diameter; strongly acid; gradual smooth boundary.
- Bw2—16 to 27 inches; yellowish brown (10YR 5/4) very gravelly silt loam; moderate medium subangular blocky structure; friable; many fine

roots; 45 percent chert and siltstone fragments up to 5 inches in diameter; strongly acid; clear smooth boundary.

Cr—27 to 60 inches; interbedded chert and weathered siltstone with strong brown (7.5YR 4/6) silty clay loam in interstices.

Depth to soft bedrock ranges from 20 to 40 inches. Coarse fragments range from 15 to 35 percent in the A horizon and from 35 to 60 percent in the B and C horizons. The fragments are dominantly chert in the A horizon and in the upper part of the B horizon and siltstone channers in the lower part of the B horizon and in the C horizon. Reaction ranges from extremely acid to strongly acid.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3, the horizon is less than 6 inches thick. The texture is gravelly silt loam.

The E horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The texture is gravelly silt loam.

The Bw and Bt horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. They have mottles in shades of red, yellow, and brown that range from none to common. The texture of the fine earth fraction is silt loam or silty clay loam.

The Cr horizon consists of interbedded, weathered siltstone and chert that has thin layers of soil material in seams between rock layers.

## Hicks Series

The Hicks series consists of deep, well drained soils. These soils formed in a silty mantle; presumably loess, and in the underlying residuum derived from siltstone and limestone. They are on ridgetops in the outer part of the Nashville Basin, mostly in the southern and western parts of the county. Slopes range from 2 to 12 percent.

Typical pedon of Hicks silt loam, 5 to 12 percent slopes, eroded; 0.9 mile east of Tennessee Highway 53 on Brush Creek-Hickman Road, north on driveway to farm house, then 200 feet north of house:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.

Bt1—10 to 24 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; strongly acid; gradual smooth boundary.

2Bt2—24 to 38 inches; strong brown (7.5YR 5/6) silty clay loam; common medium distinct yellowish

brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few distinct clay films on faces of peds; 10 percent weathered siltstone fragments; strongly acid; gradual smooth boundary.

2BC—38 to 52 inches; brown (7.5YR 4/4) very channery clay loam; common medium distinct light yellowish brown (10YR 6/4) and pale brown (10YR 6/3) mottles; weak coarse subangular blocky structure; friable; 45 percent fragments of weathered siltstone; moderately acid; clear smooth boundary.

2Cr—52 to 60 inches; interbedded, highly weathered siltstone and limestone.

Depth to soft bedrock ranges from 40 to 60 inches. Rock fragments range from 0 to 5 percent in the A and Bt horizons, from 5 to 15 percent in the 2Bt horizon, and from 35 to 60 percent in the 2BC horizon.

Reaction ranges from strongly acid to moderately acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The texture is silt loam.

The Bt and 2Bt horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The texture of the fine earth fraction is silt loam or silty clay loam.

The 2BC horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine earth fraction is silty clay loam, silt loam, or clay loam. Some pedons have texture of clay.

The 2Cr horizon is weathered, interbedded siltstone and limestone. Most of the bedrock is soft, but some pedons have thin flagstones of hard bedrock between softer strata.

## Holston Series

The Holston series consists of very deep, well drained soils that formed in loamy alluvium. These soils are on terraces of the Cumberland River. Slopes range from 2 to 25 percent.

Typical pedon of Holston loam, 5 to 12 percent slopes, eroded; 600 feet east of Rome Road on Royster Road, north 450 feet, in a cultivated field:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable; few rounded pebbles; slightly acid; abrupt wavy boundary.

Bt1—8 to 24 inches; strong brown (7.5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; slightly acid; diffuse smooth boundary.

Bt2—24 to 47 inches; strong brown (7.5YR 4/6) clay loam; few medium faint brown (7.5YR 5/4) mottles;

medium moderate subangular blocky structure; friable; common distinct reddish brown (5YR 4/4) clay films on faces of peds; common fine black manganese stains and nodules; strongly acid; gradual smooth boundary.

Bt3—47 to 70 inches; strong brown (7.5YR 4/6) clay loam; weak coarse subangular blocky structure; friable; few small black nodules; few faint clay films on faces of peds; few rounded rock fragments; strongly acid.

Depth to bedrock is more than 60 inches. In all horizons the content of rounded gravel ranges from 0 to 15 percent. Reaction is very strongly acid or strongly acid.

The Ap horizon has hue of 10YR. It has value of 4 and chroma of 3 or 4 or value of 3 and chroma of 4. The texture is loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 6 or 8. In some pedons it has mottles in shades of brown, yellow, or red. The texture is loam, clay loam, or, in a few pedons, sandy clay loam.

### Inman Series

The Inman series consists of moderately deep, well drained, clayey soils that contain flagstones of limestone. These soils formed in residuum derived from limestone interbedded with shale and siltstone. They are on side slopes of ridges and on hills in the outer part of the Nashville Basin. Slopes range from 5 to 40 percent.

Typical pedon of Inman flaggy silt loam, 12 to 25 percent slopes, eroded; 0.7 mile east of Tennessee Highway 53 on Brush Creek-Hickman Road, northwest on farm lane 500 feet along drainageway, northeast uphill 150 feet:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) flaggy silt loam; moderate medium granular structure; friable; many fine roots; 15 percent flagstones; slightly acid; clear smooth boundary.

Bw—5 to 20 inches; yellowish brown (10YR 5/4) flaggy clay; moderate medium subangular blocky structure; firm; common fine roots; 15 percent flagstones; neutral; gradual smooth boundary.

BC—20 to 35 inches; brown (10YR 5/3) flaggy clay; common fine or medium distinct yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; firm; few fine roots; 20 percent flagstones; neutral.

Cr—35 to 60 inches; interbedded soft shale and limestone.

Depth to weathered bedrock ranges from 20 to 40 inches. Content of hard limestone flagstones ranges from 10 to 35 percent. Most fragments range from 1 to 3 inches in thickness and from 4 to 15 inches in diameter. In many pedons the Cr horizon contains larger flagstones of hard limestone. The content of hard rock is higher in the Cr horizon. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. In wooded areas some pedons have a thin A horizon that has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The texture of the fine earth fraction is silt loam or silty clay loam.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. The texture of the fine earth fraction is clay, silty clay, or silty clay loam. Most pedons have few to many mottles in shades of brown and yellow.

The BC horizon has colors and textures similar to those of the Bw horizon. In many pedons it has mottles in shades of gray and brown.

### Lindell Series

The Lindell series consists of very deep, moderately well drained soils. These soils formed in loamy alluvium on flood plains, along drainageways, and in depressions. Slopes range from 0 to 3 percent.

Typical pedon of Lindell silt loam, occasionally flooded; 1.0 mile northeast of Myers Bottom Road from its intersection with Upper Ferry Road, 1,000 feet east:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; slightly acid; gradual smooth boundary.

Bw1—10 to 16 inches; brown (10YR 4/3) silt loam; few fine distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common fine roots; slightly acid; gradual smooth boundary.

Bw2—16 to 27 inches; brown (10YR 4/3) silt loam; common fine distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; moderately acid; gradual smooth boundary.

Bw3—27 to 32 inches; brown (10YR 5/3) silt loam; many medium faint pale brown (10YR 6/3), light brownish gray (10YR 6/2), and dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; friable; few fine roots; few small dark concretions; moderately acid; abrupt smooth boundary.

BC—32 to 44 inches; dark grayish brown (10YR 4/2) silty clay loam; many medium distinct pale brown (10YR 6/3) mottles; weak medium and coarse subangular blocky structure; friable; common small dark concretions; slightly acid; gradual smooth boundary.

Cg—44 to 79 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent dark brown (7.5YR 3/2), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/4) mottles; massive; friable; many small dark concretions; neutral.

Depth to bedrock is more than 60 inches. Rock fragments range from 0 to 15 percent in each horizon. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. Some pedons have an A horizon that has value of 3 and that is less than 6 inches thick. The texture is silt loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It has few to many mottles in shades of brown and gray. The texture is silt loam.

The BC horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It has few to many mottles in shades of brown and gray. The texture is silt loam or silty clay loam.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 3. It is mottled in shades of brown and gray. The texture is silt loam or silty clay loam.

## Mimosa Series

The Mimosa series consists of deep, well drained soils that have a clayey subsoil. These soils formed in residuum derived from limestone on hills and ridges in the outer part of the Nashville Basin. Slopes range from 5 to 45 percent.

Typical pedon of Mimosa silt loam, in an area of Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes; 0.8 mile east of Tennessee Highway 25 at Riddleton on Old Highway 25, then 100 yards north:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine roots; 5 percent chert fragments 1 inch or less in diameter; slightly acid; clear smooth boundary.

Bt1—6 to 11 inches; yellowish brown (10YR 5/6) silty clay; few medium distinct brown (10YR 4/3) and dark brown (10YR 3/3) mottles; moderate fine and medium subangular blocky structure; firm, sticky and plastic; many fine roots; common distinct clay

films on faces of peds; 5 percent chert fragments 1 inch or less in diameter; common fine manganese nodules; slightly acid; gradual wavy boundary.

Bt2—11 to 23 inches; yellowish brown (10YR 5/6) clay; few fine faint yellowish brown (10YR 5/4) and brown (10YR 4/3) mottles; moderate medium and fine angular blocky structure; very firm, sticky and plastic; common fine roots; many distinct clay films on faces of peds; 5 percent chert fragments 1 inch or less in diameter; common fine manganese nodules; moderately acid; gradual smooth boundary.

Bt3—23 to 32 inches; yellowish brown (10YR 5/6) clay; many medium faint yellowish brown (10YR 5/8) and brown (10YR 4/3) mottles; moderate medium and fine angular blocky structure; very firm, sticky and plastic; common fine roots; many distinct clay films on faces of peds; few fine roots; 5 percent fragments of chert 1 inch or less in diameter; common fine manganese nodules; slightly acid; gradual wavy boundary.

Bt4—23 to 42 inches; yellowish brown (10YR 5/6) clay; many medium distinct yellowish brown (10YR 5/8) and pale brown (10YR 6/3) mottles; weak medium and coarse subangular blocky structure; very firm, sticky and plastic; few distinct clay films on faces of peds; common black manganese stains; slightly acid; gradual wavy boundary.

BC—42 to 55 inches; yellowish brown (10YR 5/6) clay; many medium distinct pale brown (10YR 6/3) mottles; weak medium and coarse angular blocky structure; very firm, sticky and plastic; neutral.

R—55 inches; hard limestone bedrock.

Depth to bedrock ranges from 40 to 60 inches. Rock fragments range from 0 to 15 percent in the A horizon and from 0 to 5 in the Bt, BC, and C horizons. Reaction ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Where value is 3, the horizon is less than 7 inches thick. The texture is silt loam or silty clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. It has mottles in shades of brown and yellow. The texture is clay or silty clay, but in some pedons the uppermost few inches of the horizon is silty clay loam.

The BC and C horizons, where present, have hue of 10YR or 2.5Y, value of 5, and chroma of 4 or 6.

They have mottles in shades of gray, yellow, and brown. The texture is clay or silty clay.

## Norene Series

The Norene series consists of very deep, poorly drained soils. These soils formed in silty alluvium on low stream terraces of the Cumberland River, in depressions, and at the head of drainageways. Slopes range from 0 to 2 percent.

Typical pedon of Norene silt loam, rarely flooded; at intersection of Tennessee Highway 25 and Lover's Lane, 600 feet east of Lover's Lane and 400 feet south of Highway 25, in pasture:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.

BEg—10 to 17 inches; grayish brown (10YR 5/2) silt loam; common medium distinct dark yellowish brown (10YR 3/4) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few medium iron and manganese nodules; slightly acid; gradual smooth boundary.

Btg1—17 to 24 inches; grayish brown (10YR 5/2) silt loam; common medium distinct brown (10YR 4/3) and few fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine iron and manganese nodules; few faint clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg2—24 to 32 inches; grayish brown (10YR 5/2) silt loam; common medium distinct brown (10YR 4/3) and yellowish brown (10YR 5/4) and few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; common fine iron and manganese nodules; common faint clay films on faces of peds; strongly acid; clear smooth boundary.

Btg3—32 to 46 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct gray (10YR 5/1) and common coarse distinct yellowish brown (10YR 4/6) mottles; strong medium subangular blocky structure; friable; few fine roots; many medium and coarse iron and manganese nodules; many distinct clay films on faces of peds; light brownish gray (10YR 6/2) silt skeletons on some peds; strongly acid; gradual smooth boundary.

Btg4—46 to 65 inches; gray (10YR 5/1) silty clay loam;

common medium prominent strong brown (10YR 4/6), common medium faint dark gray (10YR 4/1), and few medium prominent red (2.5YR 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common fine and medium iron and manganese nodules; few faint clay films on faces of peds; few small white rock fragments; few light brownish gray (10YR 6/2) silt skeletons on peds; strongly acid; clear smooth boundary.

Cg—65 inches; light gray (10YR 6/1) loam; few medium distinct yellowish brown (10YR 5/4) mottles; massive; friable; common rounded pebbles; strongly acid.

Depth to bedrock is more than 60 inches. In all horizons content of coarse fragments is less than 5 percent. Reaction ranges from strongly acid to neutral.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The texture is silt loam.

The BEg horizon has hue of 10YR, value of 5, and chroma of 2. The texture is silt loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. The texture is silt loam or silty clay loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. The texture is silt loam, silty clay loam, silty clay, clay, or loam.

## Ocana Series

The Ocana series consists of very deep, well drained, gravelly soils that formed in alluvium. These soils are on flood plains of creeks and small streams that drain cherty hillsides in the outer part of the Nashville Basin. Slopes range from 0 to 3 percent.

Typical pedon of Ocana gravelly silt loam, occasionally flooded; northwest of Tennessee Highway 80 at Pleasant Shade on Little Creek Road to Big Creek Road, north on Big Creek Road 1.0 mile, east of road 150 feet across Peyton Creek, in hayfield:

Ap—0 to 8 inches; dark brown (10YR 3/3) gravelly silt loam; weak fine granular structure; very friable; common fine roots; 30 percent chert fragments up to 3 inches in diameter; slightly acid; clear smooth boundary.

Bw1—8 to 14 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; moderate medium granular structure; common fine roots; friable; 30 percent chert fragments up to 3 inches in diameter; neutral; clear smooth boundary.

Bw2—14 to 24 inches; dark yellowish brown (10YR

3/4) gravelly silt loam; moderate medium granular structure; friable; few fine roots; 15 percent chert fragments up to 3 inches in diameter; neutral; gradual smooth boundary.

Bw3—24 to 36 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; few fine faint yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; 15 percent chert fragments up to 3 inches in diameter; neutral; clear smooth boundary.

C—36 to 60 inches; dark yellowish brown (10YR 4/4) very gravelly silt loam; few fine faint yellowish brown (10YR 5/4) and dark brown (10YR 3/3) mottles; massive; friable; 35 percent chert fragments up to 3 inches in diameter; slightly acid.

Depth to bedrock is more than 60 inches. The content of coarse fragments averages 15 to 35 percent, but in some horizons it ranges to 60 percent. Reaction ranges from moderately acid to neutral.

The A horizon has hue of 10YR, value and chroma of 3 or 4. Where value and chroma are 3, the horizon is less than 10 inches thick. The texture of the fine earth fraction is silt loam.

The Bw horizon has hue of 10YR or 7.5YR. It has value of 4 and chroma of 3 or 4 or value of 3 and chroma of 4. The texture of the fine earth fraction is silt loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The texture of the fine earth fraction is silt loam or loam.

## Paden Series

The Paden series consists of very deep, moderately well drained soils that have a fragipan in the subsoil. These soils formed in silty alluvium on stream terraces. Slopes range from 2 to 5 percent.

Typical pedon of Paden silt loam, 2 to 5 percent slopes; 1,000 feet southwest of Wilburn Hollow Road on Tennessee Highway 25, about 2,200 feet south of Tennessee Highway 25 on farm road, west 800 feet on field road, north 250 feet, in cultivated field:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; common medium and fine roots; neutral; abrupt wavy boundary.

Bt1—9 to 17 inches; dark yellowish brown (10YR 4/6) silt loam; few brown pieces from the Ap horizon; weak medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—17 to 25 inches; yellowish brown (10YR 5/6) silt

loam; few fine distinct yellowish red (5YR 4/6) and yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; common fine roots; few fine manganese nodules; common faint clay films on faces of peds; strongly acid; clear smooth boundary.

E/Bx—25 to 37 inches; light brownish gray (10YR 6/2) silt loam (E material); weak medium subangular blocky structure; friable, common fine roots; light yellowish brown (10YR 6/4) and strong brown (7.5YR 4/6) silt loam (Bx material); weak medium subangular blocky structure; firm and brittle; firm and brittle; strongly acid; clear smooth boundary.

Btx—37 to 62 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct strong brown (7.5YR 4/6) and light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure; extremely firm; vertical seams of light grayish brown (10YR 6/2) silt loam; many medium black stains; strongly acid; clear smooth boundary.

Depth to bedrock is more than 60 inches. Depth to the fragipan ranges from 18 to 36 inches. Content of coarse fragments ranges from 0 to 10 percent. Reaction is very strongly acid or strongly acid.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 to 4. The texture is silt loam.

The Bt horizon has hue of 10YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it has mottles in the lower part. The texture is silt loam or silty clay loam.

The E part of the E/Bx horizon has hue of 10YR or 2.5Y. It has value of 6 or 7 and chroma of 1 to 3 or value of 5 and chroma of 1 or 2. It has mottles in shades of brown and gray. The Bx part of the E/Bx horizon has the same colors as those in the Btx horizon. In many pedons the horizon is mottled without a dominant matrix color. The texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. In most pedons it has mottles in shades of brown, gray, and yellow. In many pedons it is mottled without a dominant matrix color. The texture is silt loam or silty clay loam.

## Sandhill Series

The Sandhill series consists of deep, well drained soils. These soils formed in residuum derived from interbedded limestone, siltstone, and shale on uplands. Slopes range from 12 to 40 percent.

Typical pedon of Sandhill channery silt loam, 12 to 20 percent slopes, eroded; south on Beasley's Bend Road 4.5 miles from Tennessee Highway 25 to

driveway, 800 feet west on driveway, north 250 feet, in pasture:

Ap—0 to 9 inches; brown (10YR 4/3) channery silt loam; moderate medium granular structure; friable; many fine roots; 15 percent channers of siltstone and shale 2 inches or less in diameter; strongly acid; abrupt wavy boundary.

Bt1—9 to 16 inches; strong brown (7.5YR 4/6) channery silty clay loam; few fine faint strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; many fine roots; common distinct clay films on faces of peds and on fragments; 15 percent channers of siltstone and shale 2 inches or less in diameter; strongly acid; gradual wavy boundary.

Bt2—16 to 39 inches; strong brown (7.5YR 4/6) channery silty clay loam; few fine distinct light yellowish brown (2.5Y 6/4) mottles; strong medium subangular and angular blocky structure; friable; common fine roots; many distinct clay films on faces of peds and on fragments; 20 percent channers of siltstone and shale 1 to 8 inches in diameter; strongly acid; diffuse wavy boundary.

BC—39 to 53 inches; strong brown (7.5YR 4/6) channery silt loam; few fine distinct light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds and on fragments; 30 percent channers of siltstone and shale 1 to 12 inches in diameter; strongly acid; diffuse wavy boundary.

Cr—53 to 70 inches; strong brown (7.5YR 4/6), weathered siltstone.

Depth to soft bedrock ranges from 40 to 60 inches. Channers of weathered siltstone and shale range from 15 to 35 percent in the A and Bt horizons and from 15 to 65 percent in the C or BC horizon. The channers are about 2 inches or less in diameter in the A horizon and generally increase in quantity, size, and hardness with depth. Reaction is strongly acid or moderately acid.

The A horizon has hue of 10YR, value and chroma of 3 or 4. The texture is channery silt loam or, less commonly, channery loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It has few to many mottles in shades of red, yellow, and brown. The texture of the fine earth fraction is silty clay loam, silt loam, or, less commonly, loam or clay loam. Some pedons have thin strata of clay.

The BC or C horizon has colors similar to those of the Bt horizon or, in some pedons, is mottled without a

dominant matrix color. The textures of the fine earth fraction are the same as those in the Bt horizon.

The Cr horizon consists of interbedded siltstone, shale, and limestone. The weathered bedrock includes some hard strata of hard siltstone or limestone.

## Sengtown Series

The Sengtown series consists of very deep, well drained soils that formed in residuum derived from cherty limestone. These soils are on ridgetops that are remnants of the Highland Rim that extends into the highly dissected areas of the Nashville Basin. Slopes range from 2 to 12 percent.

Typical pedon of Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded; north 0.6 mile on Enigma Road from U.S. Highway 70N to field road at first sharp curve, northwest on field road to barn, 900 feet north of barn, and 60 feet south of pond:

Ap—0 to 7 inches; brown (10YR 4/3) gravelly silt loam; weak fine granular structure; friable; many fine roots; 20 percent chert fragments up to 3 inches in diameter; moderately acid; clear smooth boundary.

Bt1—7 to 13 inches; yellowish red (5YR 5/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; many fine roots; few faint clay films on faces of peds; 25 percent chert fragments up to 3 inches in diameter; strongly acid; clear smooth boundary.

Bt2—13 to 24 inches; yellowish red (5YR 4/6) gravelly clay; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; common fine roots; 25 percent chert fragments up to 3 inches in diameter; strongly acid; gradual smooth boundary.

Bt3—24 to 45 inches; red (2.5YR 4/6) gravelly clay; strong medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine roots; 25 percent chert fragments up to 3 inches in diameter; strongly acid; gradual smooth boundary.

Bt4—45 to 65 inches; red (2.5YR 4/6) gravelly clay; common medium distinct strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; many distinct clay films on faces of peds; 30 percent chert fragments up to 5 inches or more in diameter; strongly acid; gradual smooth boundary.

Depth to bedrock is more than 60 inches. Rock fragments range from 15 to 35 percent in all horizons. Some horizons below a depth of 60 inches range from 15 to 60 percent rock fragments. Reaction ranges from very strongly acid to moderately acid.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The texture is gravelly silt loam.

The E horizon, where present, has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. The texture is gravelly silt loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is gravelly silty clay or gravelly clay. In some pedons the upper few inches of the Bt horizon is gravelly silty clay loam that has hue of 7.5YR.

### Sykes Series

The Sykes series consists of very deep, well drained soils. These soils formed in silty alluvium or colluvium and in the underlying clayey residuum derived from limestone. They are on foot slopes and stream terraces. Slopes range from 2 to 12 percent.

Typical pedon of Sykes silt loam, 2 to 5 percent slopes; 0.4 mile west of Tennessee Highway 264 on Brush Creek-Hickman Road, southwest 1,800 feet on Thomas Road, 300 feet south in open field:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine roots; 3 percent gravel; moderately acid; abrupt smooth boundary.

Bt1—8 to 19 inches; strong brown (7.5YR 4/6) silt loam; weak fine subangular blocky structure; friable; many fine roots; common fine tubular pores; few faint clay films in pores and on faces of peds; 3 percent gravel; moderately acid; clear smooth boundary.

Bt2—19 to 28 inches; strong brown; (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common fine tubular pores; common distinct clay films in pores and on faces of peds; 12 percent gravel less than 2 inches in diameter; moderately acid; gradual smooth boundary.

2Bt3—28 to 38 inches; strong brown (7.5YR 5/6) silty clay; common medium distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; moderately acid; clear smooth boundary.

2Bt4—38 to 50 inches; yellowish brown (10YR 5/6) clay; common medium distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/8) mottles; moderate fine and medium angular blocky structure; very firm; common faint clay films on faces of peds; moderately acid; gradual smooth boundary.

2Bt5—50 to 65 inches; yellowish brown (10YR 5/6) clay; many medium distinct pale brown (10YR 6/3) and common fine prominent yellowish red (5YR 4/6) mottles; weak medium angular blocky structure; very firm; few faint clay films on faces of peds; slightly alkaline.

2R—65 inches; limestone bedrock.

Depth to bedrock is more than 60 inches. In all horizons rounded gravel and angular fragments of chert range from 0 to about 15 percent. Reaction ranges from strongly acid to moderately alkaline.

The Ap horizon has hue of 10YR, value and chroma of 3 or 4. Where value is 3, the horizon is less than 7 inches thick. The texture is silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The texture is silt loam or silty clay loam.

The 2Bt horizon has hue 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. It has few to many mottles in shades of brown and red. The texture is clay, silty clay, or silty clay loam.

The 2C horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It has few to many mottles in shades of brown, red, and gray. In some pedons it has mottles without a dominant matrix color. The texture is clay or silty clay.

### Talbott Series

The Talbott series consists of moderately deep, well drained soils on uplands. These soils formed in residuum derived from limestone in the inner part of the Nashville Basin. They are mostly in the western part of the county. Slopes range from 2 to 20 percent.

Typical pedon of Talbott silt loam, 5 to 12 percent slopes, eroded; 0.7 mile north of Highway 53 from the DeKalb County line, east 800 feet on dead-end road, 75 feet south of road:

Ap—0 to 5 inches; brown (7.5YR 4/4) silt loam; moderate fine granular structure; friable; many fine roots; 5 percent fragments of chert 1 inch or less in diameter; strongly acid; clear smooth boundary.

Bt1—5 to 12 inches; yellowish red (5YR 4/6) clay; few medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; common fine roots; common distinct clay films on faces of peds; 5 percent fragments of chert 1 inch or less in diameter; strongly acid; gradual smooth boundary.

Bt2—12 to 20 inches; yellowish red (5YR 4/6) clay; moderate medium angular blocky structure; firm;

few fine roots; many distinct clay films on faces of peds; few fragments of chert 1 inch or less in diameter; strongly acid; gradual smooth boundary.

Bt3—20 to 30 inches; red (2.5YR 4/6) clay; common medium distinct yellowish red (5YR 4/6) and pale brown (10YR 6/3) mottles; strong medium angular blocky structure; very firm; few fine roots; many distinct clay films on faces of peds; moderately acid; gradual smooth boundary.

BC—30 to 38 inches; yellowish brown (10YR 5/6) clay; common fine distinct light brownish gray (10YR 6/2) and yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; very firm; neutral.

R—38 inches; hard limestone bedrock.

Depth to bedrock ranges from 20 to 40 inches. In all horizons rock fragments range from 0 to 10 percent. Reaction is strongly acid or moderately acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Where value is 3, the horizon is less than 6 inches thick. The texture is silt loam.

The Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons it is mottled in shades of yellow, brown, and red. The texture is clay or silty clay.

The BC or C horizon, where present, has hue of 2.5Y to 5YR, value of 4 to 6, and chroma of 4 to 8. It is mottled in shades of brown, yellow, and gray. The texture is clay or silty clay.



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# Glossary

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**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 2
Low .....	2 to 4
Moderate .....	4 to 6
High .....	more than 6

**Back slope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

**Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

**Bottom land.** The normal flood plain of a stream, subject to flooding.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Broad-base terrace.** A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

**Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Catsteps.** Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

**Channery soil material.** Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

**Chiseling.** Tillage with an implement having one or

more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse fragments.** If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles 2 millimeters to 38 centimeters (15 inches) long.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

**Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

**Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

**Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Concretions.** Cemented bodies with crude internal

symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

**Conglomerate.** A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of

regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Drainage class** (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion* (geologic).— Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated).— Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Excess fines** (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity, or capillary capacity*.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Firebreak.** Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

**First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.

**Flaggy soil material.** Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

**Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

**Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

**Foot slope.** The inclined surface at the base of a hill.

**Forb.** Any herbaceous plant not a grass or a sedge.

**Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.

**Forest type.** A stand of trees similar in composition and development because of given physical and

biological factors by which it may be differentiated from other stands.

**Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

**Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.

**Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

**Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

**Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

**Ground water.** Water filling all the unblocked pores of the material below the water table.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Head out.** To form a flower head.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established.

These crops return large amounts of organic matter to the soil.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*—Soft, consolidated bedrock beneath the soil.

*R layer.*—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:  
*Basin.*—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Karst** (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Low strength.** The soil is not strong enough to support loads.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

**Munsell notation.** A designation of color by degrees

of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Narrow-base terrace.** A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Open space** A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Low .....	less than 2.0 percent
Moderate .....	2.0 to 4.0 percent
High .....	more than 4.0 percent

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedon.** The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly** (in tables). The slow movement of water through the soil adversely affects the specified use.

**Permeability.** The quality of the soil that enables water

or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow .....	less than 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow .....	0.2 to 0.6 inch
Moderate .....	0.6 inch to 2.0 inches
Moderately rapid .....	2.0 to 6.0 inches
Rapid .....	more than 6.0 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping** (in tables). Formation of subsurface tunnels or pipeline cavities by water moving through the soil.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending

through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid .....	less than 4.5
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	more than 9.0

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level .....	0 to 3 percent
Gently sloping .....	2 to 5 percent
Sloping .....	5 to 12 percent
Moderately steep .....	12 to 20 percent
Steep .....	20 to 60 percent
Very steep .....	45 percent and higher

**Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Small stones** (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates.

The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Technically, the E horizon.

Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters).

Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace** (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toe slope.** The outermost inclined surface at the base of a hill; part of a foot slope.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Upland.** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

**Variation.** Refers to patterns of contrasting colors

assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow.** The uprooting and tipping over of trees by the wind.

# Tables

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Table 1.--Temperature and Precipitation  
(Recorded in the period 1961-90 at Carthage, Tennessee)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	2 years in 10 will have--			Average number of days with snowfall	
				Maximum temperature higher than--	Minimum temperature lower than--		Less than--	More than--	0.10 inch or more		
°F	°F	°F	°F	°F	Units	In	In	In	In		
January-----	46.1	25.2	35.6	72	4	108	3.66	2.37	4.40	7	4.2
February----	50.8	28.4	39.6	76	6	65	4.42	3.26	5.19	8	1.9
March-----	60.4	36.4	48.4	84	12	156	4.93	3.31	5.90	8	.8
April-----	70.4	45.1	57.7	87	30	231	4.17	3.14	4.87	7	.0
May-----	78.1	53.3	65.7	91	35	502	4.80	3.31	5.71	8	.0
June-----	85.7	61.9	73.8	96	45	696	3.68	2.27	4.46	5	.0
July-----	88.5	66.0	77.2	98	54	831	5.38	4.09	6.26	8	.0
August-----	87.5	65.0	76.3	96	51	812	3.78	2.50	4.54	6	.0
September---	82.3	59.0	70.6	94	43	567	3.80	2.68	4.51	5	.0
October-----	71.7	46.1	58.9	86	28	264	3.11	2.05	3.73	5	.0
November----	60.7	37.6	49.1	80	16	144	4.20	3.07	4.94	7	.6
December----	50.8	30.4	40.6	73	7	0	5.50	3.65	6.59	8	.8
Yearly:											
Average----	69.4	46.2	57.8	---	---	---	---	---	---	---	---
Extreme----	---	---	---	98	7	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,376	51.43	38.71	52.99	82	8.4

\* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall  
(Recorded in the period 1973-80 at Cordell Hull, Tennessee)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 4	Apr. 9	Apr. 25
2 years in 10 later than--	Mar. 28	Apr. 4	Apr. 20
5 years in 10 later than--	Mar. 14	Mar. 26	Apr. 10
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 30	Oct. 23	Oct. 11
2 years in 10 earlier than--	Nov. 5	Oct. 28	Oct. 17
5 years in 10 earlier than--	Nov. 16	Nov. 8	Oct. 28

Table 3.--Growing Season  
(Recorded in the period 1973-80 at Cordell Hull, Tennessee)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	221	208	180
8 years in 10	230	214	187
5 years in 10	247	226	200
2 years in 10	264	237	214
1 year in 10	273	243	221

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
Ae	Arents-----	1,385	0.7
AmB2	Armour silt loam, 2 to 5 percent slopes, eroded-----	5,215	2.5
AmC2	Armour silt loam, 5 to 12 percent slopes, eroded-----	6,081	2.9
AmD2	Armour silt loam, 12 to 20 percent slopes, eroded-----	1,113	0.5
At	Arrington silt loam, occasionally flooded-----	8,477	4.1
AwE	Ashwood-Mimosa-Rock outcrop complex, 15 to 45 percent slopes-----	49,469	23.8
BaD	Barfield-Rock outcrop complex, 5 to 20 percent slopes-----	2,010	1.0
BcF	Barfield-Ashwood-Rock outcrop complex, 20 to 70 percent slopes-----	9,459	4.6
BrB2	Bradyville silt loam, 2 to 5 percent slopes, eroded-----	444	0.2
BxC2	Braxton gravelly silt loam, 5 to 12 percent slopes, eroded-----	279	0.1
BxD2	Braxton gravelly silt loam, 12 to 20 percent slopes, eroded-----	501	0.2
DeC	Dellrose gravelly silt loam, 4 to 10 percent slopes-----	2,262	1.1
DeD	Dellrose gravelly silt loam, 10 to 20 percent slopes-----	1,376	0.7
DeF	Dellrose gravelly silt loam, 20 to 60 percent slopes-----	16,252	7.8
DoB	Dowellton silty clay loam, 1 to 4 percent slopes-----	190	0.1
Eg	Egam silt loam, occasionally flooded-----	1,091	0.5
HaC2	Hampshire silt loam, 5 to 12 percent slopes, eroded-----	736	0.4
HaD2	Hampshire silt loam, 12 to 25 percent slopes, eroded-----	477	0.2
HgD	Hawthorne gravelly silt loam, 5 to 20 percent slopes-----	2,232	1.1
HgF	Hawthorne gravelly silt loam, 20 to 60 percent slopes-----	15,832	7.6
HkB2	Hicks silt loam, 2 to 5 percent slopes, eroded-----	892	0.4
HkC2	Hicks silt loam, 5 to 12 percent slopes, eroded-----	3,807	1.8
HoB2	Holston loam, 2 to 5 percent slopes, eroded-----	211	0.1
HoC2	Holston loam, 5 to 12 percent slopes, eroded-----	567	0.3
HoD2	Holston loam, 12 to 25 percent slopes, eroded-----	305	0.1
InC2	Inman flaggy silt loam, 5 to 12 percent slopes, eroded-----	577	0.3
InD2	Inman flaggy silt loam, 12 to 25 percent slopes, eroded-----	3,386	1.6
IsD2	Inman-Sandhill complex, 10 to 20 percent slopes, eroded-----	2,801	1.3
Ln	Lindell silt loam, occasionally flooded-----	2,173	1.0
MmC2	Mimosa-Ashwood complex, 5 to 12 percent slopes, eroded-----	8,503	4.1
MrC	Mimosa-Ashwood complex, 5 to 12 percent slopes, rocky-----	1,145	0.5
MrD2	Mimosa-Ashwood complex, 12 to 30 percent slopes, eroded, rocky-----	27,571	13.3
No	Norene silt loam, rarely flooded-----	190	0.1
Oc	Ocana gravelly silt loam, occasionally flooded-----	2,274	1.1
PaB	Paden silt loam, 2 to 5 percent slopes-----	1,739	0.8
SaD2	Sandhill channery silt loam, 12 to 20 percent slopes, eroded-----	4,206	2.0
SaE2	Sandhill channery silt loam, 20 to 40 percent slopes, eroded-----	394	0.2
SnE2	Sandhill-Inman complex, 20 to 40 percent slopes, eroded-----	958	0.5
StB2	Sengtown gravelly silt loam, 2 to 5 percent slopes, eroded-----	235	0.1
StC2	Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded-----	1,453	0.7
SyB	Sykes silt loam, 2 to 5 percent slopes-----	1,127	0.5
SyC2	Sykes silt loam, 5 to 12 percent slopes, eroded-----	1,312	0.6
TaB2	Talbott silt loam, 2 to 5 percent slopes, eroded-----	851	0.4
TaC2	Talbott silt loam, 5 to 12 percent slopes, eroded-----	2,169	1.0
TrB	Talbott silt loam, 2 to 5 percent slopes, rocky-----	454	0.2
TrC	Talbott silt loam, 5 to 12 percent slopes, rocky-----	1,264	0.6
TxD	Talbott-Rock outcrop complex, 5 to 20 percent slopes-----	4,755	2.3
	Water-----	8,200	4.0
	Total-----	208,400	100.0

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland.)

Map symbol	Soil name
AmB2	Armour silt loam, 2 to 5 percent slopes, eroded
At	Arrington silt loam, occasionally flooded
BrB2	Bradyville silt loam, 2 to 5 percent slopes, eroded
Eg	Egam silt loam, occasionally flooded
HkB2	Hicks silt loam, 2 to 5 percent slopes, eroded
HoB2	Holston loam, 2 to 5 percent slopes, eroded
Ln	Lindell silt loam, occasionally flooded
Oc	Ocana gravelly silt loam, occasionally flooded
PaB	Paden silt loam, 2 to 5 percent slopes
StB2	Sengtown gravelly silt loam, 2 to 5 percent slopes, eroded
SyB	Sykes silt loam, 2 to 5 percent slopes

Table 6.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Alfalfa hay	Tall fescue- ladino
		Bu	Bu	Lbs	Bu	Tons	AUM*
Ae. Arents							
AmB2----- Armour	IIe	125	45	2,900	58	4.5	8.5
AmC2----- Armour	IIIe	110	40	2,700	55	4.2	8.0
AmD2----- Armour	IVe	90	30	2,200	48	3.8	7.0
At----- Arrington	IIw	135	48	2,700	52	4.2	9.0
AwE*----- Ashwood-Mimosa- Rock outcrop	VIIIs	---	---	---	---	---	3.5
BaD*----- Barfield-Rock outcrop	VIIs	---	---	---	---	---	---
BcF*----- Barfield- Ashwood-Rock outcrop	VIIIs	---	---	---	---	---	---
BrB2----- Bradyville	IIe	90	32	2,200	50	3.5	7.0
BxC2----- Braxton	IIIe	80	28	1,900	45	3.2	6.5
BxD2----- Braxton	IVe	---	---	---	38	2.8	6.0
DeC----- Dellrose	IIIe	90	32	2,300	45	4.0	7.5
DeD----- Dellrose	IVe	75	25	2,000	30	3.6	6.5
DeF----- Dellrose	VIIe	---	---	---	---	---	5.0
DoB----- Dowellton	IVw	---	25	---	---	---	5.0
Eg----- Egam	IIw	110	45	2,000	45	---	8.0
HaC2----- Hampshire	IIIe	75	25	1,900	42	3.2	6.5
HaD2----- Hampshire	IVe	---	---	---	35	2.8	5.5

See footnotes at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Alfalfa hay	Tall fescue- ladino
		Bu	Bu	Lbs	Bu	Tons	AUM*
HgD----- Hawthorne	VIIs	---	---	---	---	---	4.0
HgF----- Hawthorne	VIIIs	---	---	---	---	---	---
HkB2----- Hicks	IIe	90	35	2,500	45	3.5	7.5
HkC2----- Hicks	IIIe	80	28	2,000	42	3.0	6.5
HoB2----- Holston	IIe	100	40	2,500	50	4.5	7.5
HoC2----- Holston	IIIe	85	35	2,250	45	4.2	7.0
HoD2----- Holston	IVe	65	---	---	36	3.5	6.0
InC2----- Inman	IVe	---	---	---	---	---	5.0
InD2----- Inman	VIe	---	---	---	---	---	4.0
IsD2----- Inman-Sandhill	VIe	---	---	---	---	---	4.5
Ln----- Lindell	IIw	120	45	1,900	45	---	8.5
MmC2----- Mimosa-Ashwood	IVe	---	---	---	40	---	5.5
MrC----- Mimosa-Ashwood	IVs	---	---	---	---	---	5.5
MrD2----- Mimosa-Ashwood	VIIs	---	---	---	---	---	4.5
No----- Norene	IVw	---	30	---	---	---	6.5
Oc----- Ocana	IIw	90	35	1,800	40	3.0	7.0
PaB----- Paden	IIe	95	40	2,000	45	---	7.5
SaD2----- Sandhill	IVe	---	---	---	35	---	5.5
SaE2----- Sandhill	VIe	---	---	---	---	---	4.5
SnE2----- Sandhill-Inman	VIIe	---	---	---	---	---	4.0

See footnotes at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Alfalfa hay	Tall fescue- ladino
		Bu	Bu	Lbs	Bu	Tons	AUM*
StB2----- Sengtown	IIE	90	32	2,200	48	3.5	7.0
StC2----- Sengtown	IIIe	80	28	1,900	45	3.2	6.5
SyB----- Sykes	IIE	110	42	2,700	50	4.0	8.0
SyC2----- Sykes	IIIe	95	38	2,400	45	3.6	7.0
TaB2----- Talbot	IIIe	60	25	1,600	40	---	5.5
TaC2----- Talbot	IVe	---	---	---	35	---	5.0
TrB----- Talbot	IVs	---	---	---	40	---	5.5
TrC----- Talbot	IVs	---	---	---	40	---	5.0
TxD**----- Talbot-Rock outcrop	VIe	---	---	---	---	---	4.0

\* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

\*\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equip-ment limitation	Seedling-mortality	Wind-throw hazard	Plant competi-tion	Common trees	Site index	Volume*	
AmB2, AmC2----- Armour	Slight	Slight	Slight	Slight	Moderate	Northern red oak--- White oak----- Yellow-poplar----- Loblolly pine-----	70 70 90 77	57 57 86 100	Yellow-poplar, loblolly pine, black walnut.
AmD2----- Armour	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak--- White oak----- Yellow-poplar----- Loblolly pine-----	70 70 90	57 57 86	Yellow-poplar, loblolly pine, black walnut.
At----- Arrington	Slight	Slight	Slight	Slight	Severe	Yellow-poplar----- White oak----- Southern red oak--- Loblolly pine----- Black walnut-----	100 80 80 90 ---	114 57 57 129 ---	Yellow-poplar, black walnut, loblolly pine.
AwE**: Ashwood-----	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Black locust, eastern redcedar.
Mimosa-----	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Loblolly pine, eastern redcedar.
Rock outcrop.									
BaD**: Barfield-----	Slight	Slight	Moderate	Severe	Moderate	Eastern redcedar--- Pignut hickory----	40 ---	43 ---	Eastern redcedar.
Rock outcrop.									
BcF**: Barfield-----	Severe	Severe	Moderate	Severe	Moderate	Eastern redcedar--- Pignut hickory----	40 ---	43 --	Eastern redcedar.
Ashwood-----	Severe	Severe	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Black locust, eastern redcedar.
Rock outcrop.									
BrB2----- Bradyville	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak--- White oak----- Eastern redcedar---	90 70 70 40	86 57 57 43	Yellow-poplar, loblolly pine.
BxC2----- Braxton	Slight	Slight	Slight	Slight	Moderate	Northern red oak--- Eastern redcedar--- Loblolly pine-----	70 50 80	57 57 114	Yellow-poplar, redcedar, loblolly pine.
BxD2----- Braxton	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak--- Eastern redcedar--- Loblolly pine-----	70 50 80	57 57 114	Yellow-poplar, loblolly pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Plant competi- tion	Common trees	Site index	Volume*	
DeC----- Dellrose	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak---- Loblolly pine-----	98 76 90	100 57 129	Yellow-poplar, loblolly pine, black walnut.
DeD----- Dellrose	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak---- Loblolly pine-----	98 76 90	100 57 129	Yellow-poplar, loblolly pine, black walnut.
DeF----- Dellrose	Severe	Severe	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak---- Loblolly pine-----	98 76 90	100 57 129	Yellow-poplar, loblolly pine, black walnut.
DoB----- Dowellton	Slight	Moderate	Moderate	Slight	Severe	Sweetgum----- Loblolly pine----- Water oak-----	80 80 90	86 114 86	Sweetgum, American sycamore.
Eg----- Egam	Slight	Slight	Slight	Slight	Severe	Yellow-poplar----- Loblolly pine----- Southern red oak---- Water oak-----	100 90 80 90	114 129 57 86	Yellow-poplar, black walnut, loblolly pine.
HaC2----- Hampshire	Moderate	Slight	Slight	Slight	Moderate	Southern red oak---- Loblolly pine----- Eastern redcedar---	70 80 50	57 114 57	Yellow-poplar, loblolly pine.
HaD2----- Hampshire	Severe	Moderate	Slight	Slight	Moderate	Southern red oak---- Loblolly pine----- Eastern redcedar---	70 80 50	57 114 57	Yellow-poplar, loblolly pine.
HgD----- Hawthorne	Slight	Slight	Moderate	Slight	Moderate	Southern red oak---- Shortleaf pine----- Mockernut hickory--	60 60 ---	43 86 ---	Loblolly pine, shortleaf pine.
HgF----- Hawthorne	Moderate	Severe	Moderate	Slight	Moderate	Southern red oak---- Shortleaf pine----- Mockernut hickory--	60 60 ---	43 86 ---	Loblolly pine, shortleaf pine.
HkB2----- Hicks	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar----- Southern red oak---- Shortleaf pine-----	90 70 70	86 57 114	Yellow-poplar, loblolly pine.
HkC2----- Hicks	Moderate	Slight	Slight	Slight	Moderate	Yellow-poplar----- Southern red oak---- Shortleaf pine-----	90 70 70	86 57 114	Yellow-poplar, loblolly pine.
HoB2, HoC2----- Holston	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak---- Shortleaf pine-----	86 78 69	86 57 114	Yellow-poplar, loblolly pine, black walnut.
HoD2----- Holston	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar----- Northern red oak---- Shortleaf pine-----	86 69 69	86 57 114	Yellow-poplar, loblolly pine, black walnut.
InC2----- Inman	Slight	Moderate	Moderate	Slight	Moderate	Southern red oak---- Shortleaf pine----- Eastern redcedar---	70 70 50	57 114 57	Loblolly pine, shortleaf pine, black locust.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equip-ment limitation	Seedling-mortality	Wind-throw hazard	Plant competi-tion	Common trees	Site index	Volume*	
InD2----- Inman	Moderate	Moderate	Moderate	Slight	Moderate	Southern red oak--- Shortleaf pine----- Eastern redcedar---	70 70 50	57 114 57	Loblolly pine, shortleaf pine, black locust.
IsD2**: Inman-----	Moderate	Moderate	Moderate	Slight	Moderate	Southern red oak--- Shortleaf pine----- Eastern redcedar---	70 70 50	57 114 57	Loblolly pine, shortleaf pine, black locust.
Sandhill-----	Slight	Moderate	Slight	Slight	Moderate	Southern red oak--- Yellow-poplar----- Loblolly pine-----	70 90 80	57 86 114	Yellow-poplar, loblolly pine.
Ln----- Lindell	Slight	Slight	Slight	Slight	Severe	Yellow-poplar----- Northern red oak--- Loblolly pine----- Sweetgum-----	100 80 90 90	114 57 129 100	Yellow-poplar, black walnut, loblolly pine, cherrybark oak.
MmC2**, MrC**: Mimosa-----	Slight	Slight	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Loblolly pine, eastern redcedar.
Ashwood-----	Slight	Slight	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Black locust, eastern redcedar.
MrD2**: Mimosa-----	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Loblolly pine, eastern redcedar.
Ashwood-----	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak--- Loblolly pine----- Eastern redcedar---	65 80 45	43 114 57	Black locust, eastern redcedar.
No----- Norene	Slight	Moderate	Severe	Slight	Severe	Sweetgum----- Water oak----- Hackberry----- Eastern cottonwood-	90 80 --- 95	100 72 --- 114	Sweetgum, eastern cottonwood.
Oc----- Ocana	Slight	Slight	Slight	Slight	Severe	Yellow-poplar----- White oak----- Loblolly pine-----	100 80 90	114 57 129	Yellow-poplar, black walnut, loblolly pine.
PaB----- Paden	Slight	Moderate	Slight	Moderate	Moderate	Southern red oak--- Sweetgum----- Loblolly pine----- Shortleaf pine----	70 80 80 75	57 86 114 114	Southern red oak, sweetgum, loblolly pine.
SaD2, SaE2----- Sandhill	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak--- Yellow-poplar----- Loblolly pine-----	70 90 80	57 86 114	Yellow-poplar, loblolly pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Plant competi- tion	Common trees	Site index	Volume*	
SnE2**:									
Sandhill-----	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak---	70	57	Yellow-poplar,
						Yellow-poplar-----	90	86	loblolly pine.
						Loblolly pine-----	80	114	
Inman-----	Moderate	Moderate	Moderate	Slight	Moderate	Southern red oak---	70	57	Loblolly pine,
						Shortleaf pine-----	70	114	shortleaf
						Eastern redcedar---	50	57	pine, black
									locust.
StB2, StC2-----	Slight	Slight	Slight	Slight	Moderate	Southern red oak---	70	57	Yellow-poplar,
Sengtown						Yellow-poplar-----	90	86	loblolly pine.
						Shortleaf pine-----	70	114	
SyB-----	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-----	100	114	Yellow-poplar,
Sykes						Northern red oak---	80	57	loblolly pine,
						White oak-----	80	57	black walnut,
						Shagbark hickory---	---	---	black locust.
						Black walnut-----	---	---	
						Black locust-----	---	---	
SyC2-----	Moderate	Slight	Slight	Slight	Moderate	Yellow-poplar-----	100	114	Yellow-poplar,
Sykes						Northern red oak---	80	57	loblolly pine,
						White oak-----	80	57	black walnut.
						Black walnut-----	---	---	
TaB2, TaC2, TrB, TrC-----	Slight	Slight	Slight	Slight	Moderate	Northern red oak---	65	43	Loblolly pine,
Talbott						Loblolly pine-----	80	114	eastern
						Eastern redcedar---	46	57	redcedar,
						Pignut hickory-----	---	---	Virginia pine.
TxD**:									
Talbott-----	Slight	Slight	Slight	Slight	Moderate	Northern red oak---	65	43	Loblolly pine,
						Loblolly pine-----	80	114	eastern
						Eastern redcedar---	46	57	redcedar,
						Pignut hickory-----	---	---	Virginia pine.
Rock outcrop.									

\* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

\*\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ae. Arents					
AmB2----- Armour	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
AmC2----- Armour	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
AmD2----- Armour	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
At----- Arrington	Severe: flooding.	Slight-----	Moderate: flooding.	Slight-----	Moderate: flooding.
AwE*: Ashwood-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mimosa-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Rock outcrop.					
BaD*: Barfield-----	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight-----	Severe: depth to rock.
Rock outcrop.					
BcF*: Barfield-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Ashwood-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
BrB2----- Bradyville	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: erodes easily.	Slight.
BxC2----- Braxton	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight-----	Moderate: small stones, slope.
BxD2----- Braxton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DeC----- Dellrose	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight-----	Moderate: small stones, large stones.
DeD----- Dellrose	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
DeF----- Dellrose	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
DoB----- Dowellton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Eg----- Egam	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight-----	Moderate: flooding.
HaC2----- Hampshire	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
HaD2----- Hampshire	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
HgD----- Hawthorne	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight-----	Moderate: small stones, large stones, slope.
HgF----- Hawthorne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
HkB2----- Hicks	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
HkC2----- Hicks	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
HoB2----- Holston	Slight-----	Slight-----	Moderate: slope, small stones.	Slight-----	Slight.
HoC2----- Holston	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
HoD2----- Holston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
InC2----- Inman	Moderate: slope, large stones, percs slowly.	Moderate: slope, large stones, percs slowly.	Severe: large stones, slope.	Moderate: large stones.	Severe: large stones.
InD2----- Inman	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
IsD2*:					
Inman-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope.
Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: slope.
Ln-----					
Lindell-----	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness.	Slight-----	Moderate: flooding.
MmC2*, MrC*:					
Mimosa-----	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----	Moderate: slope.
Ashwood-----	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
MrD2*:					
Mimosa-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Ashwood-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
No-----					
Norene-----	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Oc-----					
Ocana-----	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight-----	Moderate: small stones, large stones, flooding.
PaB-----					
Paden-----	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
SaD2-----					
Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: slope.
SaE2-----					
Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SnE2*:					
Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Inman-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.	Severe: large stones, slope.
StB2-----					
Sengtown-----	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight-----	Moderate: small stones.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
StC2----- Sengtown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight-----	Moderate: small stones, slope.
SyB----- Sykes	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: erodes easily.	Slight.
SyC2----- Sykes	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
TaB2----- Talbot	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight-----	Moderate: depth to rock.
TaC2----- Talbot	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
TrB----- Talbot	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight-----	Moderate: depth to rock.
TrC----- Talbot	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
TxD*: Talbot-----	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
Rock outcrop.					

See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ae.										
Arents										
AmB2----- Armour	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AmC2----- Armour	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AmD2----- Armour	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
At----- Arrington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AwE*:										
Ashwood----- Mimosa-----	Very poor.	Fair	Poor	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
Bad*:										
Barfield----- Rock outcrop.	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BcF*:										
Barfield----- Ashwood-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
BrB2----- Bradyville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BxC2----- Braxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BxD2----- Braxton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DeC----- Dellrose	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DeD----- Dellrose	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DeF----- Dellrose	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
DoB----- Dowellton	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair	Fair.
Eg----- Egam	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HaC2----- Hampshire	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HaD2----- Hampshire	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HgD----- Hawthorne	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
HgF----- Hawthorne	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HkB2----- Hicks	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HkC2----- Hicks	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HoB2----- Holston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HoC2----- Holston	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HoD2----- Holston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
InC2, InD2----- Inman	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
IsD2*: Inman-----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Sandhill-----	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Ln----- Lindell	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MmC2*, MrC*: Mimosa-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ashwood-----	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MrD2*: Mimosa-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ashwood-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
No----- Norene	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Oc----- Ocana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
PaB----- Paden	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SaD2----- Sandhill	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SaE2----- Sandhill	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SnE2*: Sandhill-----	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Inman-----	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
StB2, StC2----- Sengtown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SyB----- Sykes	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SyC2----- Sykes	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TaB2----- Talbott	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TaC2----- Talbott	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TrB----- Talbott	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrC----- Talbott	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TxD*: Talbott-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ae. Arents						
AmB2----- Armour	Slight-----	Slight-----	Slight-----	Slight-----	Severe: low strength.	Slight.
AmC2----- Armour	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
AmD2----- Armour	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
At----- Arrington	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
AwE*: Ashwood-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Mimosa-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop.						
BaD*: Barfield-----	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: depth to rock.
Rock outcrop.						
BcF*: Barfield-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: slope, depth to rock.
Ashwood-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop.						
BrB2----- Bradyville	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BxC2----- Braxton	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
BxD2----- Braxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
DeC----- Dellrose	Moderate: too clayey.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: small stones, large stones.
DeD----- Dellrose	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: small stones, slope.
DeF----- Dellrose	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DoB----- Dowellton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
Eg----- Egam	Moderate: too clayey, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
HaC2----- Hampshire	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
HaD2----- Hampshire	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
HgD----- Hawthorne	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
HgF----- Hawthorne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HkB2----- Hicks	Slight-----	Slight-----	Slight-----	Slight-----	Severe: low strength.	Slight.
HkC2----- Hicks	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
HoB2----- Holston	Slight-----	Slight-----	Slight-----	Slight-----	Slight-----	Slight.
HoC2----- Holston	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
HoD2----- Holston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
InC2----- Inman	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope, large stones.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Severe: large stones.
InD2----- Inman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: large stones, slope.
IsD2*: Inman-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: large stones, slope.
Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ln----- Lindell	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
MmC2*, MrC*: Mimosa-----	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
Ashwood-----	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope, depth to rock.
MrD2*: Mimosa-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Ashwood-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
No----- Norene	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.
Oc----- Ocana	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones, large stones, flooding.
PaB----- Paden	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
SaD2, SaE2----- Sandhill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SnE2*: Sandhill-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SnE2*: Inman-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: large stones, slope.
StB2----- Sengtown	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Moderate: small stones.
StC2----- Sengtown	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
SyB----- Sykes	Moderate: too clayey.	Slight-----	Moderate: shrink-swell.	Slight-----	Severe: low strength.	Slight.
SyC2----- Sykes	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
TaB2----- Talbott	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: depth to rock.
TaC2----- Talbott	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
TrB----- Talbott	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: depth to rock.
TrC----- Talbott	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
TxD*: Talbott-----	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
Rock outcrop.						

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ae. Arents					
AmB2----- Armour	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, thin layer.
AmC2----- Armour	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
AmD2----- Armour	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
At----- Arrington	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
AwE*: Ashwood-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Mimosa-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Rock outcrop.					
BaD*: Barfield-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
BcF*: Barfield-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Ashwood-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BrB2----- Bradyville	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
BxC2----- Braxton	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BxD2----- Braxton	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
DeC----- Dellrose	Slight-----	Severe: seepage.	Moderate: too clayey.	Severe: seepage.	Moderate: small stones.
DeD----- Dellrose	Moderate: slope.	Severe: seepage, slope.	Moderate: too clayey, slope.	Severe: seepage.	Poor: small stones, slope.
DeF----- Dellrose	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
DoB----- Dowellton	Severe: wetness, percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Eg----- Egam	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
HaC2----- Hampshire	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
HaD2----- Hampshire	Severe: slope, percs slowly.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
HgD----- Hawthorne	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
HgF----- Hawthorne	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HkB2----- Hicks	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Poor: thin layer.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HkC2----- Hicks	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: thin layer.
HoB2----- Holston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, small stones.
HoC2----- Holston	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
HoD2----- Holston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
InC2----- Inman	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
InD2----- Inman	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
IsD2*: Inman-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Sandhill-----	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
Ln----- Lindell	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, small stones, wetness.
MmC2*, MrC*: Mimosa-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Ashwood-----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
MrD2*: Mimosa-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MrD2*: Ashwood-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
No----- Norene	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Oc----- Ocana	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: small stones.
PaB----- Paden	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
SaD2, SaE2----- Sandhill	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
SnE2*: Sandhill-----	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
Inman-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
StB2----- Sengtown	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----- slope.	Poor: too clayey, hard to pack, small stones.
StC2----- Sengtown	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
SyB----- Sykes	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----- slope.	Poor: too clayey, hard to pack.
SyC2----- Sykes	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
TaB2----- Talbutt	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
TaC2----- Talbutt	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TrB----- Talbot	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
TrC----- Talbot	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
TxD*: Talbot-----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ae. Arents				
AmB2----- Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
AmC2----- Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
AmD2----- Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
At----- Arrington	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
AwE*: Ashwood-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Mimosa-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
BaD*: Barfield-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop.				
BcF*: Barfield-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Ashwood-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
BrB2----- Bradyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BxC2----- Braxton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
BxD2----- Braxton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
DeC----- Dellrose	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
DeD----- Dellrose	Fair: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DeF----- Dellrose	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DoB----- Dowellton	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Eg----- Egam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
HaC2----- Hampshire	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim.
HaD2----- Hampshire	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, slope.
HgD----- Hawthorne	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HgF----- Hawthorne	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HkB2, HkC2----- Hicks	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
HoB2, HoC2----- Holston	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HoD2----- Holston	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
InC2----- Inman	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones.
InD2----- Inman	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones, slope.
IsD2*: Inman-----	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones, slope.
Sandhill-----	Fair: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
Ln----- Lindell	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
MmC2*, MrC*: Mimosa-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ashwood-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MrD2*: Mimosa-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Ashwood-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
No----- Norene	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Oc----- Ocana	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
PaB----- Paden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
SaD2----- Sandhill	Fair: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SaE2----- Sandhill	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
SnE2*: Sandhill-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
Inman-----	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones, slope.
StB2, StC2----- Sengtown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
SyB, SyC2----- Sykes	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, thin layer.
TaB2, TaC2, TrB, TrC-- Talbot	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TxD*: Talbot-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rock outcrop.				

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas*	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ae. Arents						
AmB2----- Armour	Moderate: seepage.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
AmC2, AmD2----- Armour	Moderate: seepage.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
At----- Arrington	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
AwE**: Ashwood-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Mimosa-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Rock outcrop.						
BaD**: Barfield-----	Severe: depth to rock.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
BcF**: Barfield-----	Severe: depth to rock, slope.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Ashwood-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop.						
BrB2----- Bradyville	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
BxC2, BxD2----- Braxton	Slight-----	Severe: hard to pack.	Deep to water	Slope-----	Slope-----	Slope.
DeC----- Dellrose	Severe: seepage.	Severe: piping.	Deep to water	Slope-----	Favorable-----	Favorable.
DeD, DeF----- Dellrose	Severe: seepage.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.

See footnotes at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas*	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
DoB----- Dowellton	Moderate: depth to rock.	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Eg----- Egam	Slight-----	Severe: hard to pack.	Deep to water	Flooding-----	Favorable-----	Favorable.
HaC2, HaD2----- Hampshire	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
HgD, HgF----- Hawthorne	Severe: seepage.	Severe: piping.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
HkB2----- Hicks	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
HkC2----- Hicks	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
HoB2----- Holston	Moderate: seepage.	Severe: piping.	Deep to water	Slope-----	Favorable-----	Favorable.
HoC2, HoD2----- Holston	Moderate: seepage.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.
InC2, InD2----- Inman	Moderate: depth to rock.	Severe: hard to pack, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
IsD2**: Inman-----	Moderate: depth to rock.	Severe: hard to pack, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Sandhill-----	Severe: seepage.	Severe: piping.	Deep to water	Large stones, slope.	Slope, large stones.	Large stones, slope.
Ln----- Lindell	Moderate: seepage.	Severe: piping.	Flooding-----	Wetness, flooding.	Wetness-----	Favorable.
MmC2**, MrC**, MrD2**: Mimosa-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Ashwood-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
No----- Norene	Moderate: seepage.	Severe: thin layer, ponding.	Ponding-----	Ponding, erodes easily.	Erodes easily, ponding.	Wetness, erodes easily.
Oc----- Ocana	Severe: seepage.	Moderate: piping.	Deep to water	Flooding-----	Favorable-----	Favorable.

See footnotes at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas*	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
PaB----- Paden	Moderate: seepage.	Severe: piping.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
SaD2, SaE2----- Sandhill	Severe: seepage.	Severe: piping.	Deep to water	Large stones, slope.	Slope, large stones.	Large stones, slope.
SnE2**: Sandhill-----	Severe: seepage.	Severe: piping.	Deep to water	Large stones, slope.	Slope, large stones.	Large stones, slope.
Inman-----	Moderate: depth to rock.	Severe: hard to pack, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
StB2----- Sengtown	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Slope-----	Favorable-----	Favorable.
StC2----- Sengtown	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Slope-----	Slope-----	Slope.
SyB----- Sykes	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
SyC2----- Sykes	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
TaB2----- Talbutt	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
TaC2----- Talbutt	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
TrB----- Talbutt	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
TrC----- Talbutt	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
TxD*: Talbutt-----	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rock outcrop.						

\* Slope may limit the storage capacity of the reservoir area; therefore, an onsite evaluation is needed.

\*\* See map unit description for composition and behavior characteristics of the map unit.

Table 14.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ae. Arents											
AmB2, AmC2, AmD2- Armour	0-10	Silt loam-----	CL-ML, CL, ML	A-4	0	90-100	80-100	75-95	70-90	25-35	5-10
	10-50	Silty clay loam, silt loam.	CL	A-4, A-6	0	90-100	80-100	75-95	70-95	30-40	8-18
	50-74	Silty clay loam, silty clay, clay.	ML, MH, GM, GC	A-4, A-6, A-7	0-3	60-100	50-95	45-90	40-85	35-53	9-23
At----- Arrington	0-27	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	90-100	85-95	75-95	25-40	4-15
	27-40	Silt loam, silty clay loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-95	25-40	4-15
	40-65	Silt loam, silty clay loam, clay.	CL, ML, MH	A-4, A-6, A-7	0	85-100	75-100	65-95	55-95	28-55	8-25
AwE*: Ashwood-----	0-13	Silt loam-----	CL, ML, CL-ML	A-4, A-6, A-7	0-15	95-100	90-100	85-100	70-95	25-49	6-22
	13-31	Clay, silty clay Unweathered bedrock.	MH, CH ---	A-7 ---	0-15 ---	95-100 ---	90-100 ---	85-100 ---	75-95 ---	51-75 ---	20-40 ---
Mimosa-----	0-6	Silt loam-----	CL, ML	A-4, A-6, A-7	0	80-100	75-100	65-95	60-90	25-45	7-20
	6-11	Silty clay loam, silty clay, clay.	ML, CL, MH, CH	A-7	0	95-100	90-100	85-95	80-90	45-60	18-28
	11-55	Clay, silty clay Unweathered bedrock.	CH, MH ---	A-7 ---	0 ---	95-100 ---	90-100 ---	85-95 ---	80-95 ---	51-65 ---	25-35 ---
Rock outcrop.											
BaD*: Barfield-----	0-4	Silty clay loam	CL, CH, MH	A-6, A-7	0-10	90-100	85-95	80-90	75-85	35-65	12-35
	4-14	Silty clay, clay, flaggy clay.	CH, MH, CL	A-7, A-6	0-20	70-100	65-90	60-85	55-80	35-70	14-40
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BcF*: Barfield-----	0-4	Silty clay loam	CL, CH, MH	A-6, A-7	0-10	90-100	85-95	80-90	75-85	35-65	12-35
	4-14	Silty clay, clay, flaggy clay.	CH, MH, CL	A-7, A-6	0-20	70-100	65-90	60-85	55-80	35-70	14-40
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
BcF*: Ashwood-----	0-13	Silt loam-----	CL, ML, CL-ML	A-4, A-6, A-7	0-15	95-100	90-100	85-100	70-95	25-49	6-22
	13-31	Clay, silty clay	MH, CH	A-7	0-15	95-100	90-100	85-100	75-95	51-75	20-40
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BrB2----- Bradyville	0-6	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	70-95	65-90	15-35	3-15
	6-15	Silty clay loam, clay.	CH, MH	A-7	0-5	80-100	75-100	65-90	60-85	52-70	26-40
	15-48	Silty clay, clay	CH, MH	A-7	0-10	80-100	75-100	65-90	60-85	52-70	26-40
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
BxC2----- Braxton	0-6	Gravelly silt loam.	CL-ML, CL, GC, GM-GC	A-4, A-6	0-2	60-80	50-75	45-65	40-55	25-40	7-18
	6-60	Clay-----	CL, CH, MH	A-7	0	80-100	75-100	65-95	60-90	45-65	22-34
BxD2----- Braxton	0-15	Gravelly silt loam.	CL-ML, CL, GC, GM-GC	A-4, A-6	0-2	60-80	50-75	45-65	40-55	25-40	7-18
	15-60	Clay-----	CL, CH, MH	A-7	0	80-100	75-100	65-95	60-90	45-65	22-34
DeC, DeD, DeF---- Dellrose	0-9	Gravelly silt loam.	CL-ML, SC, CL, GC	A-4, A-6	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	9-68	Gravelly silty clay loam, gravelly silt loam.	ML, CL, GC, SC	A-4, A-6, A-7	0-15	60-90	55-90	50-75	40-70	30-45	8-18
DoB----- Dowellton	0-4	Silty clay loam	CL-ML, CL, ML	A-4, A-6	0	100	95-100	90-100	85-96	25-40	6-15
	4-10	Silty clay loam, clay.	CL, CH, MH	A-7	0	100	95-100	90-100	85-100	45-70	22-40
	10-44	Clay-----	CH, MH	A-7	0	100	95-100	90-100	85-100	55-70	28-40
	44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Eg----- Egam	0-23	Silt loam, silty clay loam.	CL, ML, CL-ML	A-6, A-7, A-4	0	95-100	95-100	85-100	75-95	21-45	4-20
	23-65	Silty clay, silty clay loam, clay.	CL, MH, CH	A-7, A-6	0	95-100	95-100	90-100	85-95	38-60	15-30
HaC2, HaD2----- Hampshire	0-10	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	95-100	95-100	90-100	80-90	20-40	3-20
	10-30	Clay, silty clay loam, silty clay.	CL, CH, MH	A-7	0-3	80-100	75-100	65-95	55-85	45-70	21-38
	30-49	Channery clay, very channery clay loam, very channery silty clay loam.	CL, GC, SC, GM	A-6, A-7, A-2	10-50	55-75	50-75	40-70	30-60	30-48	11-25
	49	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
HgD, HgF----- Hawthorne	0-16	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	16-27	Very gravelly silty clay loam, very gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	27-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
HkB2, HkC2----- Hicks	0-10	Silt loam-----	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	75-90	20-30	4-12
	10-24	Silty clay loam, silt loam.	CL, ML	A-4, A-6, A-7	0	95-100	95-100	90-100	85-95	28-42	8-18
	24-38	Clay loam, silty clay loam.	CL, CH, MH, ML	A-6, A-7	0-20	95-100	85-95	80-90	60-80	35-60	13-32
	38-52	Very channery clay loam, very channery loam, very channery silty clay loam.	CL, MH, GC, SC	A-4, A-6, A-7	20-50	65-100	60-90	55-85	40-75	25-55	8-25
	52-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
HoB2, HoC2, HoD2- Holston	0-8	Loam-----	ML, CL-ML, SM, SC-SM	A-4, A-2	0-5	80-100	75-100	65-100	30-75	<22	NP-6
	8-47	Loam, clay loam, sandy clay loam.	ML, CL-ML, SM, SC-SM	A-4, A-2	0-5	80-100	75-100	50-100	30-80	21-33	3-10
	47-70	Clay loam, loam, gravelly clay loam.	ML, CL, GC, SC	A-4, A-6, A-7, A-2	0-15	60-100	55-100	50-100	30-80	30-50	7-22
InC2, InD2----- Inman	0-5	Flaggy silt loam	CL	A-6, A-7	20-50	95-100	90-100	85-95	70-90	28-45	10-20
	5-35	Flaggy silty clay, flaggy clay, flaggy silty clay loam.	CH, CL, MH	A-6, A-7	20-50	95-100	90-100	85-95	75-95	38-60	16-30
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
IsD2*: Inman-----	0-5	Flaggy silt loam	CL	A-6, A-7	20-50	95-100	90-100	85-95	70-90	28-45	10-20
	5-35	Flaggy silty clay, flaggy clay, flaggy silty clay loam.	CH, CL, MH	A-6, A-7	20-50	95-100	90-100	85-95	75-95	38-60	16-30
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
IsD2*: Sandhill-----	0-9	Channery silt loam.	ML, CL, CL-ML	A-4, A-6	15-30	85-90	80-90	70-85	55-70	16-35	3-13
	9-39	Channery silty clay loam, flaggy clay loam, channery loam.	CL-ML, CL	A-4, A-6	20-35	90-95	85-95	75-90	60-75	23-40	7-16
	39-53	Channery silt loam, channery clay loam, channery silty clay loam.	GM-GC, CL, GC, SC	A-4, A-1, A-2	20-45	50-90	45-90	35-75	20-55	20-30	5-10
	53-70	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
						Pct					
Ln----- Lindell	0-10	Silt loam-----	ML, CL, CL-ML	A-4	0	90-100	75-100	65-90	55-80	18-30	3-10
	10-79	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0-2	90-100	75-95	65-90	55-80	23-39	6-18
MmC2*, MrC*, MrD2*: Mimosa-----	0-6	Silt loam-----	CL, ML	A-4, A-6, A-7	0	80-100	75-100	65-95	60-90	25-45	7-20
	6-11	Silty clay loam, silty clay, clay.	ML, CL, MH, CH	A-7	0	95-100	90-100	85-95	80-90	45-60	18-28
	11-55 55	Clay, silty clay Unweathered bedrock.	CH, MH ---	A-7 ---	0 ---	95-100 ---	90-100 ---	85-95 ---	80-95 ---	51-65 ---	25-35 ---
Ashwood-----	0-13	Silt loam-----	CL, ML, CL-ML	A-4, A-6, A-7	0-15	95-100	90-100	85-100	70-95	25-49	6-22
	13-31 31	Clay, silty clay Unweathered bedrock.	MH, CH ---	A-7 ---	0-15 ---	95-100 ---	90-100 ---	85-100 ---	75-95 ---	51-75 ---	20-40 ---
No----- Norene	0-24	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	70-95	25-35	4-12
	24-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	95-100	90-100	85-100	75-95	30-43	11-20
	46-65	Silty clay loam, silty clay, clay.	CL, CH, MH	A-7, A-6	0	95-100	90-100	85-100	75-95	38-60	15-32
Oc----- Ocana	0-8	Gravelly silt loam.	CL-ML, CL, SM, GM	A-4, A-6	0-8	65-80	60-75	50-70	36-65	20-35	3-12
	8-60	Gravelly silt loam, gravelly loam, gravelly clay loam.	GM-GC, CL, GC, GM	A-4, A-6, A-2	0-8	60-80	55-75	45-65	30-55	20-40	3-18
PaB----- Paden	0-9	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-95	75-90	20-40	3-15
	9-25	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	90-100	85-95	75-95	25-40	6-15
	25-62	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	90-100	85-95	70-90	25-40	6-16
SaD2, SaE2----- Sandhill	0-9	Channery silt loam.	ML, CL, CL-ML	A-4, A-6	15-30	85-90	80-90	70-85	55-70	16-35	3-13
	9-39	Channery silty clay loam, flaggy clay loam, channery loam.	CL-ML, CL	A-4, A-6	20-35	90-95	85-95	75-90	60-75	23-40	7-16
	39-53	Channery silt loam, channery clay loam, channery silty clay loam.	GM-GC, CL, GC, SC	A-4, A-1, A-2	20-45	50-90	45-90	35-75	20-55	20-30	5-10
	53-70	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
SnE2*: Sandhill-----	0-9	Channery silt loam.	ML, CL, CL-ML	A-4, A-6	15-30	85-90	80-90	70-85	55-70	16-35	3-13
	9-39	Channery silty clay loam, flaggy clay loam, channery loam.	CL-ML, CL	A-4, A-6	20-35	90-95	85-95	75-90	60-75	23-40	7-16
	39-53	Channery silt loam, channery clay loam, channery silty clay loam.	GM-GC, CL, GC, SC	A-4, A-1, A-2	20-45	50-90	45-90	35-75	20-55	20-30	5-10
	53-70	Weathered bedrock	---	---	---	---	---	---	---	---	---
SnE2*: Inman-----	0-5	Flaggy silt loam	CL	A-6, A-7	20-50	95-100	90-100	85-95	70-90	28-45	10-20
	5-35	Flaggy silty clay, flaggy clay, flaggy silty clay loam.	CH, CL, MH	A-6, A-7	20-50	95-100	90-100	85-95	75-95	38-60	16-30
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
StB2, StC2----- Sengtown	0-7	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25-35	4-10
	7-13	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	13-65	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
SyB, SyC2----- Sykes	0-8	Silt loam-----	ML, CL-ML, CL	A-4, A-6	0	85-100	85-100	75-100	65-90	25-35	5-12
	8-28	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	85-100	85-100	80-100	70-95	30-42	8-18
	28-50	Clay, silty clay, silty clay loam.	MH, CH, CL	A-7	0	85-100	85-100	80-100	70-95	41-65	18-35
	50-65	Clay, silty clay	MH, CH, CL	A-7	0-5	85-100	85-100	80-100	70-95	45-70	20-38
	65	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TaB2, TaC2, TrB, TrC----- Talbott	0-5	Silt loam-----	CL	A-4, A-6	0-5	95-100	90-100	85-95	75-95	25-40	8-16
	5-38	Clay, silty clay	CL, MH, CH	A-7	0-10	95-100	90-100	85-95	80-95	41-80	20-45
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TxD*: Talbott-----	0-5	Silt loam-----	CL	A-4, A-6	0-5	95-100	90-100	85-95	75-95	25-40	8-16
	5-38	Clay, silty clay	CL, MH, CH	A-7	0-10	95-100	90-100	85-95	80-95	41-80	20-45
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Ae.										
Arents										
AmB2, AmC2, AmD2- Armour	0-10 10-50 50-74	15-27 22-35 30-50	1.30-1.45 1.30-1.50 1.35-1.55	0.6-2.0 0.6-2.0 0.6-2.0	0.18-0.23 0.17-0.20 0.10-0.18	5.1-6.0 5.1-6.0 5.1-6.0	Low----- Low----- Moderate-----	0.43 0.37 0.37	5	1-3
At----- Arrington	0-27 27-40 40-65	18-35 18-35 20-45	1.30-1.45 1.30-1.45 1.30-1.45	0.6-2.0 0.6-2.0 0.6-2.0	0.19-0.22 0.19-0.22 0.17-0.22	6.1-7.8 6.1-7.8 6.1-7.8	Low----- Low----- Low-----	0.37 0.37 0.32	5	2-3
AwE*: Ashwood-----	0-13 13-31 31	22-40 40-60 ---	1.20-1.40 1.30-1.45 ---	0.6-2.0 0.2-0.6 0.0-0.06	0.14-0.18 0.12-0.15 ---	5.6-7.8 5.6-7.8 ---	Moderate----- High----- -----	0.28 0.24 ---	2	2-3
Mimosa-----	0-6 6-11 11-55 55	24-40 35-55 45-60 ---	1.30-1.50 1.30-1.50 1.35-1.55 ---	0.6-2.0 0.2-0.6 0.06-0.2 ---	0.12-0.20 0.12-0.16 0.10-0.16 ---	4.5-6.0 4.5-6.0 4.5-6.0 ---	Low----- Moderate----- Moderate----- -----	0.37 0.28 0.24 ---	3	1-2
Rock outcrop.										
BaD*: Barfield-----	0-4 4-14 14	35-55 35-55 ---	1.50-1.62 1.55-1.65 ---	0.2-0.6 0.2-0.6 ---	0.10-0.15 0.09-0.14 ---	6.1-7.8 6.1-7.8 ---	Moderate----- High----- -----	0.24 0.17 ---	1	2-4
Rock outcrop.										
BcF*: Barfield-----	0-4 4-14 14	35-55 35-55 ---	1.50-1.62 1.55-1.65 ---	0.2-0.6 0.2-0.6 ---	0.10-0.15 0.09-0.14 ---	6.1-7.8 6.1-7.8 ---	Moderate----- High----- -----	0.24 0.17 ---	1	2-4
Ashwood-----	0-13 13-31 31	22-40 40-60 ---	1.20-1.40 1.30-1.45 ---	0.6-2.0 0.2-0.6 0.0-0.06	0.14-0.18 0.12-0.15 ---	5.6-7.8 5.6-7.8 ---	Moderate----- High----- -----	0.28 0.24 ---	2	2-3
Rock outcrop.										
BrB2----- Bradyville	0-6 6-15 15-48 48	18-27 40-60 48-60 ---	1.40-1.55 1.30-1.50 1.30-1.50 ---	0.6-2.0 0.2-0.6 0.2-0.6 0.00-0.06	0.18-0.22 0.10-0.15 0.10-0.15 ---	5.1-6.5 5.1-6.0 5.1-7.8 ---	Low----- Moderate----- Moderate----- -----	0.43 0.28 0.28 ---	3	.5-2
BxC2----- Braxton	0-6 6-60	20-35 45-65	1.35-1.50 1.25-1.45	2.0-6.0 0.2-0.6	0.12-0.18 0.10-0.15	5.1-6.0 5.1-6.5	Low----- Moderate-----	0.28 0.20	5	1-2
BxD2----- Braxton	0-15 15-60	20-35 45-65	1.35-1.50 1.25-1.45	2.0-6.0 0.2-0.6	0.12-0.18 0.10-0.15	5.1-6.0 5.1-6.5	Low----- Moderate-----	0.28 0.20	5	1-2
DeC, DeD, DeF---- Dellrose	0-9 9-68	15-27 20-35	1.20-1.40 1.20-1.40	2.0-6.0 2.0-6.0	0.10-0.17 0.09-0.16	4.5-6.0 4.5-6.0	Low----- Low-----	0.24 0.24	5	1-3

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
DoB----- Dowellton	0-4	20-40	1.35-1.50	0.6-2.0	0.16-0.20	5.1-7.3	Low-----	0.32	3	.5-2
	4-10	50-65	1.35-1.50	0.06-0.2	0.12-0.16	5.1-7.3	High-----	0.32		
	10-44	60-75	1.30-1.40	0.06-0.2	0.11-0.15	5.1-7.8	High-----	0.32		
	44	---	---	0.0-0.06	---	---	-----	---		
Eg----- Egam	0-23	20-35	1.30-1.45	0.2-0.6	0.18-0.22	5.6-7.3	Moderate----	0.32	5	2-3
	23-65	35-50	1.30-1.45	0.2-0.6	0.14-0.20	5.6-7.3	Moderate----	0.32		
HaC2, HaD2----- Hampshire	0-10	15-27	1.35-1.50	0.6-2.0	0.18-0.22	4.5-6.0	Low-----	0.43	3	1-2
	10-30	35-55	1.25-1.45	0.2-0.6	0.12-0.16	4.5-6.0	Moderate----	0.28		
	30-49	22-40	1.30-1.50	0.0-0.2	0.07-0.12	4.5-6.0	Low-----	0.24		
	49	---	---	---	---	---	-----	---		
HgD, HgF----- Hawthorne	0-16	12-25	1.40-1.50	2.0-6.0	0.14-0.18	3.6-5.5	Low-----	0.20	2	1-2
	16-27	15-32	1.40-1.50	2.0-6.0	0.05-0.10	3.6-5.5	Low-----	0.10		
	27-60	---	---	0.0-0.2	---	---	-----	---		
HkB2, HkC2----- Hicks	0-10	15-30	1.35-1.45	0.6-2.0	0.18-0.22	5.1-6.5	Low-----	0.43	3	.5-2
	10-24	20-35	1.35-1.50	0.6-2.0	0.16-0.20	5.1-6.0	Low-----	0.37		
	24-38	30-45	1.35-1.50	0.6-2.0	0.14-0.18	5.1-6.0	Moderate----	0.32		
	38-52	25-40	1.35-1.50	0.6-2.0	0.07-0.12	5.1-6.0	Low-----	0.24		
	52-60	---	---	0.0-0.2	---	---	-----	---		
HoB2, HoC2, HoD2- Holston	0-8	10-25	1.35-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low-----	0.28	5	.5-2
	8-47	18-35	1.40-1.55	0.6-2.0	0.13-0.20	4.5-5.5	Low-----	0.32		
	47-70	20-45	1.40-1.60	0.6-2.0	0.10-0.18	4.5-5.5	Low-----	0.32		
InC2, InD2----- Inman	0-5	25-40	1.30-1.45	0.6-2.0	0.08-0.12	5.6-7.3	Moderate----	0.28	2	.5-2
	5-35	35-55	1.35-1.55	0.2-0.6	0.06-0.11	5.6-7.3	Moderate----	0.24		
	35-60	---	---	0.0-0.2	---	---	-----	---		
IsD2*: Inman-----	0-5	25-40	1.30-1.45	0.6-2.0	0.08-0.12	5.6-7.3	Moderate----	0.28	2	.5-2
	5-35	35-55	1.35-1.55	0.2-0.6	0.06-0.11	5.6-7.3	Moderate----	0.24		
	35-60	---	---	0.0-0.2	---	---	-----	---		
Sandhill-----	0-9	15-30	1.35-1.55	2.0-6.0	0.12-0.16	5.1-6.0	Low-----	0.24	3	.5-2
	9-39	18-35	1.35-1.55	2.0-6.0	0.10-0.14	5.1-6.0	Low-----	0.20		
	39-53	18-32	1.35-1.55	2.0-6.0	0.05-0.11	5.1-6.0	Low-----	0.20		
	53-70	---	---	0.06-0.6	---	---	-----	---		
Ln----- Lindell	0-10	20-32	1.35-1.50	0.6-2.0	0.16-0.20	5.6-7.3	Low-----	0.32	5	1-3
	10-79	20-35	1.35-1.50	0.6-2.0	0.14-0.17	5.6-7.3	Low-----	0.28		
MmC2*, MrC*, MrD2*: Mimosa-----	0-6	24-40	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low-----	0.37	3	1-2
	6-11	35-55	1.30-1.50	0.2-0.6	0.12-0.16	4.5-6.0	Moderate----	0.28		
	11-55	45-60	1.35-1.55	0.06-0.2	0.10-0.16	4.5-6.0	High-----	0.24		
	55	---	---	---	---	---	-----	---		
Ashwood-----	0-13	22-40	1.20-1.40	0.6-2.0	0.14-0.18	5.6-7.8	Moderate----	0.28	2	2-3
	13-31	40-60	1.30-1.45	0.2-0.6	0.12-0.15	5.6-7.8	High-----	0.24		
	31	---	---	0.0-0.06	---	---	-----	---		
No----- Norene	0-24	16-27	1.35-1.60	0.6-2.0	0.18-0.22	5.6-7.3	Low-----	0.43	5	.5-2
	24-46	23-36	1.35-1.60	0.6-2.0	0.16-0.22	5.6-7.3	Low-----	0.43		
	46-65	35-45	1.30-1.55	0.2-0.6	0.12-0.18	5.6-7.3	Moderate----	0.37		
Oc----- Ocana	0-8	18-27	1.35-1.50	2.0-6.0	0.12-0.18	5.6-7.3	Low-----	0.28	5	1-2
	8-60	20-32	1.35-1.50	2.0-6.0	0.10-0.17	5.6-7.3	Low-----	0.28		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
	In	Pct	g/cc	In/hr	In/in	pH		K	T	Pct
PaB----- Paden	0-9	18-32	1.30-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low-----	0.43	3	.5-2
	9-25	20-32	1.40-1.55	0.6-2.0	0.18-0.22	4.5-5.5	Low-----	0.43		
	25-62	20-35	1.60-1.80	0.06-0.2	0.07-0.12	4.5-5.5	Low-----	0.43		
SaD2, SaE2----- Sandhill	0-9	15-30	1.35-1.55	2.0-6.0	0.12-0.16	5.1-6.0	Low-----	0.24	3	.5-2
	9-39	18-35	1.35-1.55	2.0-6.0	0.10-0.14	5.1-6.0	Low-----	0.20		
	39-53	18-32	1.35-1.55	2.0-6.0	0.05-0.11	5.1-6.0	Low-----	0.20		
	53-70	---	---	0.06-0.6	---	---	-----	---		
SnE2*: Sandhill-----	0-9	15-30	1.35-1.55	2.0-6.0	0.12-0.16	5.1-6.0	Low-----	0.24	3	.5-2
	9-39	18-35	1.35-1.55	2.0-6.0	0.10-0.14	5.1-6.0	Low-----	0.20		
	39-53	18-32	1.35-1.55	2.0-6.0	0.05-0.11	5.1-6.0	Low-----	0.20		
	53-70	---	---	0.06-0.6	---	---	-----	---		
Inman-----	0-5	25-40	1.30-1.45	0.6-2.0	0.08-0.12	5.6-7.3	Moderate-----	0.28	2	.5-2
	5-35	35-55	1.35-1.55	0.2-0.6	0.06-0.11	5.6-7.3	Moderate-----	0.24		
	35-60	---	---	0.0-0.2	---	---	-----	---		
StB2, StC2----- Sengtown	0-7	12-27	1.35-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low-----	0.28	5	1-2
	7-13	23-40	1.35-1.55	0.6-2.0	0.10-0.15	4.5-6.0	Low-----	0.24		
	13-65	40-60	1.35-1.60	0.6-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.24		
SyB, SyC2----- Sykes	0-8	15-27	1.35-1.55	0.6-2.0	0.19-0.23	5.1-6.5	Low-----	0.43	5	1-2
	8-28	24-35	1.35-1.55	0.6-2.0	0.18-0.22	5.1-6.0	Low-----	0.37		
	28-50	35-60	1.30-1.50	0.2-0.6	0.13-0.17	5.1-6.0	Moderate-----	0.32		
	50-65	45-60	1.30-1.50	0.2-0.6	0.12-0.16	5.6-7.8	Moderate-----	0.32		
	65	---	---	---	---	---	-----	---		
TaB2, TaC2, TrB, TrC----- Talbutt	0-5	15-27	1.35-1.50	0.6-2.0	0.10-0.18	5.1-6.0	Moderate-----	0.37	2	.5-2
	5-38	40-60	1.40-1.60	0.06-0.6	0.10-0.14	5.1-6.0	Moderate-----	0.24		
	38	---	---	0.00-0.06	---	---	-----	---		
TxD*: Talbutt-----	0-5	15-27	1.35-1.50	0.6-2.0	0.10-0.18	5.1-6.0	Moderate-----	0.37	2	.5-2
	5-38	40-60	1.40-1.60	0.06-0.6	0.10-0.14	5.1-6.0	Moderate-----	0.24		
	38	---	---	0.00-0.06	---	---	-----	---		
Rock outcrop.										

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
Ae.											
Arents											
AmB2, AmC2, AmD2-Armour	B	None			>6.0						Moderate
At-Arrington	B	Occasional	Very brief	Dec-Mar	4.0-6.0	Apparent	Jan-Mar	>60			Low
AwE*											
Ashwood	C	None			>6.0			20-40	Hard		High
Mimosa	C	None			>6.0			40-60	Hard		High
Rock outcrop.											
BaD*											
Barfield	D	None			>6.0			8-20	Hard		High
Rock outcrop.											
BcF*											
Barfield	D	None			>6.0			8-20	Hard		High
Ashwood	C	None			>6.0			20-40	Hard		High
Rock outcrop.											
BrB2-Bradyville	C	None			>6.0			40-60	Hard		High
BxC2, BxD2-Braxton	C	None			>6.0			>60			High
DeC, DeD, DeF-Dellrose	B	None			>6.0			>60			High
DoB-Dowellton	D	None			0.5-1.0	Perched	Dec-Mar	40-60	Hard		High

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
Eg----- Egam	C	Occasional	Very brief	Dec-Mar	3.0-4.0	Apparent	Dec-Mar	>60	---	High	Low.
HaC2, HaD2----- Hampshire	C	None	---	---	>6.0	---	---	40-60	Soft	High	Moderate.
HgD, HgF----- Hawthorne	B	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
HxB2, HxC2----- Hicks	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate.
HoB2, HoC2, HoD2--- Holston	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
InC2, InD2----- Inman	C	None	---	---	>6.0	---	---	20-40	Soft	High	Low.
IsD2*: Inman-----	C	None	---	---	>6.0	---	---	20-40	Soft	High	Low.
Sandhill-----	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate.
Ln----- Lindell	C	Occasional	Very brief	Dec-Mar	2.0-3.0	Apparent	Dec-Mar	>60	---	Moderate	Low.
MmC2*, MrC*, MrD2*: Mimosa-----	C	None	---	---	>6.0	---	---	40-60	Hard	High	Moderate.
Ashwood-----	C	None	---	---	>6.0	---	---	20-40	Hard	High	Low.
No----- Norene	C	Rare	Brief	Dec-Mar	+1-1.0	Apparent	Jan-Mar	>60	---	High	Low.
Oc----- Ocana	B	Occasional	Very brief	Dec-Mar	>6.0	---	---	>60	---	Low	Low.
PaB----- Paden	C	None	---	---	1.5-3.0	Perched	Dec-Mar	>60	---	High	Moderate.
SaD2, SaE2----- Sandhill	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate.

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
SnE2*: Sandhill	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate.
Inman	C	None	---	---	>6.0	---	---	20-40	Soft	High	Low.
StB2, StC2 Sengtown	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
SyB, SyC2 Sykes	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Tab2, TaC2, TrB, TrC Talbot	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
TxD*: Talbot	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Rock outcrop.											

\* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Classification of the Soils

Soil name	Family or higher taxonomic class
Armour-----	Fine-silty, mixed, thermic Ultic Hapludalfs
Arrington-----	Fine-silty, mixed, thermic Cumulic Hapludolls
Ashwood-----	Fine, mixed, thermic Typic Argiudolls
Barfield-----	Clayey, mixed, thermic Lithic Hapludolls
Bradyville-----	Fine, mixed, thermic Typic Hapludalfs
Braxton-----	Fine, mixed, thermic Typic Paleudalfs
Dellrose-----	Fine-loamy, mixed, thermic Humic Hapludults
Dowellton-----	Very fine, mixed, thermic Vertic Ochraqualfs
Egam-----	Fine, mixed, thermic Cumulic Hapludolls
Hampshire-----	Fine, mixed, thermic Ultic Hapludalfs
Hawthorne-----	Loamy-skeletal, siliceous, thermic Ruptic-Ultic Dystrochrepts
Hicks-----	Fine-silty, mixed, thermic Ultic Hapludalfs
Holston-----	Fine-loamy, siliceous, thermic Typic Paleudults
Inman-----	Fine, mixed, thermic Ruptic-Alfic Eutrochrepts
Lindell-----	Fine-loamy, mixed, thermic Fluvaquentic Eutrochrepts
Mimosa-----	Fine, mixed, thermic Typic Hapludalfs
Norene-----	Fine-silty, mixed, thermic Aeric Ochraqualfs
Ocana-----	Fine-loamy, mixed, thermic Dystric Fluventic Eutrochrepts
Paden-----	Fine-silty, mixed, thermic Glossic Fragiudults
Sandhill-----	Fine-loamy, mixed, thermic Ultic Hapludalfs
Sengtown-----	Fine, mixed, thermic Typic Paleudalfs
Sykes-----	Fine-silty, mixed, thermic Typic Paleudalfs
Talbott-----	Fine, mixed, thermic Typic Hapludalfs

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