United States
Department of
Agriculture

Natural
Resources
Conservation
Service

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

Soil Survey of Grainger County, Tennessee

Detailed maps are available in two formats. Digital copies (SSURGO) that can be used in a Geographic Information System (GIS) can be accessed at http://www.ftw.nrcs.usda.gov/ssur_data.html. (The State Soil Survey Area ID is TN057.) Paper copies of the maps can be obtained from the Grainger County Soil Conservation District, Route 2, Box 31, Hwy. 11-W, Rutledge, TN 37861 (telephone number 423-828-5211).

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.

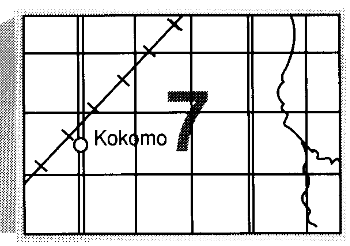
Detailed Soil Maps

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.



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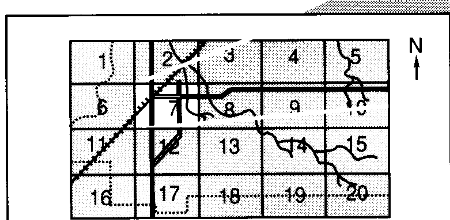

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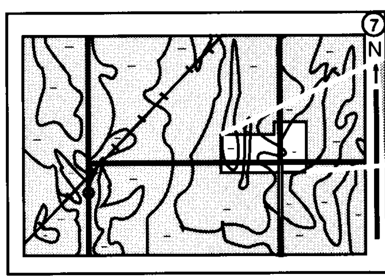

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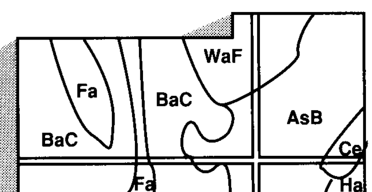

AREA OF INTEREST

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.

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 1991. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1991. This survey was made cooperatively by the Natural Resources Conservation Service, the Tennessee Agricultural Experiment Station, the Grainger County Board of Commissioners, and the Tennessee Department of Agriculture. The survey is part of the technical assistance furnished to the Grainger 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.

Cover: Hay is an important crop in many rolling areas in Grainger County. Dewey silt loam, 5 to 12 percent slopes, eroded, is the dominant soil in the foreground. Clinch Mountain is in the background.

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").

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Issued 2000

Foreword

This soil survey contains information that affects land use planning in Grainger County. 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
State Conservationist
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Soil Survey of Grainger County, Tennessee

By Nathan T. Hartgrove, Natural Resources Conservation Service

Fieldwork by Nathan T. Hartgrove and Jack D. Colflesh, Natural Resources Conservation Service, and Phillip D. Dixon and William B. Patterson, Grainger County

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

General Nature of the County

GRAINGER COUNTY is in the northeastern part of Tennessee (fig. 1). It is bordered on the north by Claiborne and Hancock Counties, on the south by Hamblen and Jefferson Counties, on the east by Hawkins County, and on the west by Knox and Union Counties. The Department of Economic and Community Development estimated the population of Grainger County to be 17,400 in 1988.

The county is irregular in shape, measuring about 28 miles from northeast to southwest and about 12 miles from north to south. It has 193,700 acres, which consists of 181,500 acres of land and 12,200 acres of water. The county is divided roughly into the northern and southern parts by Clinch Mountain and the Poor Valley Knobs, which extend across the county from northeast to southwest.

The county is in the Southern Appalachian Ridges and Valleys major land resource area. The soils in this area formed under forest vegetation and are dominantly light in color. The soils in the Clinch Mountain and Poor Valley Knobs area are shallow to deep over sandstone or shale bedrock. The soils in the rest of the county are shallow to very deep, dominantly over limestone or shale bedrock.

This soil survey updates the survey of Grainger County published in 1948 (USDA, 1948). It provides additional information and has larger maps, which show the soils in greater detail.

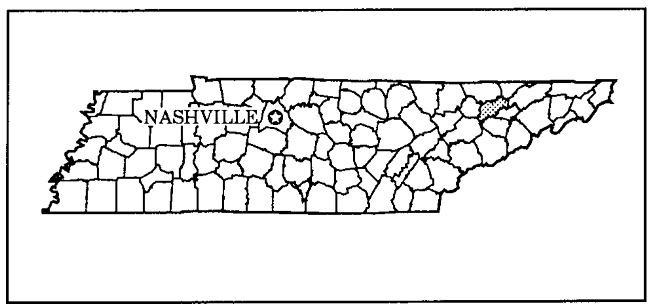

Figure 1.—Location of Grainger County in Tennessee.

History

The area that is now known as Grainger County, between the Clinch and Holston Rivers, was originally inhabited by the Cherokee Indians. It was settled by whites about 1785. The first settlements were south of Clinch Mountain, at Bean Station in the Richland Valley, and north of Clinch Mountain, at the head of Flat Creek. These settlers were largely Scotch-Irish and German.

The North Carolina Legislature established Grainger County on April 22, 1796 (Holt and others, 1976). The county originally included parts of present-day Claiborne, Hamblen, Campbell, Union, and Hawkins Counties. From 1801 to 1870, Grainger County was reduced in size to its present borders. In 1801, the county seat was established at Rutledge, in the central part of the county, and the first courthouse was erected. Bean Station, at the eastern edge of the county, bordering Hawkins County, is growing as more people move into the Cherokee Lake communities nearby.

Natural Resources

Grainger County has an abundant supply of limestone. Numerous limestone quarries that provide gravel and lime products are throughout the county.

The county has a good supply of fresh water. Streams that flow throughout the year are common. There are two large areas of impounded water—Cherokee and Norris Lakes.

Industry

Industry in Grainger County employs more than 1,800 people. The major enterprises in the county include textile, furniture, and mobile home manufacturing; trailer making; and metal working.

The housing industry has expanded slightly in recent years, keeping pace with a growing population in some parts of the county. Residential subdivisions are becoming more common all over the county. Most of the residential units are single-family dwellings, but a few multiple-family residential complexes have been built.

Transportation Facilities

U.S. Highways 11W and 25E and State Highway 92 merge in Grainger County, providing ready access to the surrounding counties and to the cities of Knoxville and Morristown. Rutledge is 30 miles from access to Interstate 40. Grainger County has a good network of local roads and streets. Several roads in remote parts of the county are unpaved. Several motor freight companies located in nearby cities serve the county.

The airport nearest to Rutledge is in Morristown. It is a medium-intensity municipal airport. The nearest commercial air service is provided by Knoxville's McGhee-Tyson Airport.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Jefferson City, Tennessee, in the period 1953 to 1988. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 38 degrees F and the average daily minimum temperature is 27 degrees. The lowest temperature on record, which occurred at Jefferson City on January 21, 1985, is -26 degrees. In summer, the average temperature is 75 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred on August 21, 1983, is 102 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 39.65 inches. Of this, about 21 inches, or more than 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 18 inches. The heaviest 1-day rainfall during the period of record was 4.82 inches at Jefferson City on May 7, 1984. Thunderstorms occur on about 47 days each year.

The average seasonal snowfall is about 10.4 inches. The greatest snow depth at any one time during the period of record was 7 inches. On the average, 1 day of the year has at least 1 inch of snow on the ground.

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 northeast. Average windspeed is highest, 9 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.

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

General Soil Map Units

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. Dewey-Hamblen-Townley

Nearly level to steep, well drained and moderately well drained soils with a loamy surface layer and a loamy or clayey subsoil; on uplands and flood plains underlain by limestone and shale

This map unit consists of soils on dissected uplands underlain by limestone and shale and on the adjacent bottom land in the Richland Valley.

This map unit makes up about 2 percent of the county. It is about 49 percent Dewey soils, 18 percent Hamblen soils, 17 percent Townley soils, and 16 percent soils of minor extent.

The undulating and rolling Dewey soils are on the broad ridgetops and side slopes of uplands underlain by limestone. They are very deep soils with a loamy surface layer and a clayey subsoil.

The nearly level Hamblen soils are on bottom land and are frequently flooded for brief periods. They are very deep and are loamy throughout.

The rolling to steep Townley soils are on the ridgetops and side slopes of uplands underlain by shale that is interbedded with limestone or fine grained sandstone in places. They are moderately deep soils with a loamy surface layer and a clayey subsoil.

Of minor extent in this map unit are the shallow Montevallo soils on shale uplands and the poorly drained Bloomingdale soils in depressions on flood plains.

The major part of this map unit has been cleared and is used for hay or pasture. Some of the less sloping areas are used for row crops. Most of the unit is moderately suited or poorly suited to row crops. The slope and the hazard of erosion are severe limitations on the hilly and steep parts of the unit. Wetness and the hazard of flooding are moderate limitations in areas of the Hamblen soils. This unit is well suited or moderately suited to woodland. Woodland is not abundant, however, because much of the unit has been cleared for agricultural use.

This map unit is moderately suited or poorly suited to urban uses. The depth to bedrock in the Townley soils, the hazard of flooding on the Hamblen soils, and the clayey subsoil in the Dewey and Townley soils are the major limitations affecting these uses.

2. Wallen-Jefferson

Rolling to very steep, somewhat excessively drained and well drained soils that are loamy throughout; on uplands, benches, and foot slopes

This map unit consists of hilly to very steep soils on convex uplands on the Poor Valley Knobs, rolling to steep soils in coves and on foot slopes and benches in Poor Valley, and soils in areas of south-facing coves and foot slopes on Clinch Mountain.

This map unit makes up about 10 percent of the county. It is about 47 percent Wallen soils, 30 percent Jefferson soils, and 23 percent soils of minor extent.

The hilly to very steep Wallen soils are on convex uplands. They are moderately deep, loamy soils with a high content of rock fragments throughout.

The rolling to steep Jefferson soils are in coves and on foot slopes and benches. They are very deep and are loamy throughout.

Of minor extent in this map unit are the moderately well drained Sewanee soils on flood plains, the poorly drained Bloomingdale soils in depressions on flood plains, and the well drained Townley and Montevallo soils on uplands underlain by shale.

Most of this map unit is used as woodland. Some of the less steep areas have been cleared and are used for hay or pasture. This unit is moderately suited or unsuited to agricultural uses. The slope and the hazard of erosion are serious management concerns. The soils in this unit are well suited, moderately suited, or poorly suited to woodland. Erosion during harvesting and reforestation and equipment limitations are management concerns on the steep and very steep parts of the unit.

Most of this map unit is poorly suited to urban uses because of the slope. The depth to bedrock also is a limitation in areas of the Wallen soils.

3. Waynesboro-Elk-Shady

Nearly level to hilly, well drained soils with a loamy surface layer and a loamy or clayey subsoil; on stream terraces

This map unit consists of soils on low stream terraces along the Holston River and the adjacent high stream terraces that are dissected by drainageways.

This map unit makes up about 1 percent of the county. It is about 37 percent Waynesboro soils, 28 percent Elk soils, 17 percent Shady soils, and 18 percent soils of minor extent.

The rolling and hilly Waynesboro soils are on the tops and side slopes of high terraces. They are very deep soils with a loamy surface layer and a clayey subsoil.

The nearly level Elk soils are on low stream terraces adjacent to the river and below limestone outcrops and bluffs. They are very deep, loamy soils that are less acid than the other soils in the unit and have a higher content of silt.

The nearly level and undulating Shady soils are on low stream terraces adjacent to the river. They are very deep and are loamy throughout.

Of minor extent in this map unit are the well drained Etowah soils on the foot slopes of high terraces, the moderately well drained Hamblen soils in drainageways, and the well drained Dewey soils on uplands.

Most of this map unit has been cleared and is used for row crops or hay. Some of the steeper areas used for pasture. This unit is well suited or moderately suited to row crops, except for the hilly part. The unit is well suited to hay and pasture. The slope and the hazard of erosion are significant management concerns on the rolling and hilly parts of the unit. This unit is well suited to woodland, but woodland is not abundant because of the intensive agricultural uses.

This map unit is well suited or moderately suited to most urban uses. The slope and the clayey subsoil are limitations in areas of the Waynesboro soils.

4. Dewey-Etowah

Undulating to steep, well drained soils with a loamy surface layer and a loamy or clayey subsoil; on uplands underlain by limestone and dolomite

This map unit consists of undulating and rolling soils on ridgetops and rolling to steep soils on side slopes and foot slopes.

This map unit makes up about 29 percent of the county. It is about 47 percent Dewey soils, 29 percent Etowah soils, and 24 percent soils of minor extent.

Dewey soils are on convex side slopes and ridgetops. They are very deep soils with a loamy surface layer and a clayey subsoil.

Etowah soils are on benches, foot slopes, and concave side slopes. They formed in colluvium and in the underlying clayey residuum. These very deep soils are loamy to a depth of about 40 inches and clayey below that depth.

Of minor extent in this map unit are Minvale soils on foot slopes and in drainageways and Fullerton soils on narrow, convex ridgetops.

Most areas of this map unit have been cleared and are used for hay, pasture, or row crops. The undulating and rolling soils are well suited or moderately suited to row crops. This unit is well suited or moderately suited to hay and pasture, except for the steepest areas. The slope and the hazard of erosion are serious management concerns on the steeper parts of the unit. This unit is well suited to woodland. The acreage of woodland is small, however, because most of the unit has been cleared and is used for crops or pasture.

This map unit is well suited or moderately suited to urban uses, except for the steep areas. The slope is the major limitation on the hilly and steep parts of the unit. The clayey subsoil of the Dewey soils is an additional limitation.

5. Fullerton-Minvale

Rolling to steep, well drained soils with a loamy surface layer and a loamy or clayey subsoil; on uplands underlain by cherty limestone

This map unit consists of soils on narrow, convex ridgetops and steep, convex side slopes and soils in areas of coves, foot slopes, and benches that are mostly concave.

This map unit makes up about 10 percent of the county. It is about 50 percent Fullerton soils, 33 percent Minvale soils, and 17 percent soils of minor extent.

The rolling to steep Fullerton soils are on convex ridgetops and side slopes. They are very deep soils with a loamy surface layer and a clayey subsoil.

The hilly and steep Minvale soils are in coves and on foot slopes and benches. They formed in colluvial material washed from the cherty uplands and are loamy throughout.

Of minor extent in this map unit are Dewey soils on uplands and Etowah soils on benches, on foot slopes, and in colluvial areas in drainageways.

Most of the rolling and hilly areas of this map unit have been cleared and are used for pasture or hay. Significant areas of woodland remain on the steeper parts of the unit. This unit is moderately suited, poorly suited, or unsuited to row crops and is well suited, moderately suited, or poorly suited to hay and pasture. The slope and the hazard of erosion are serious management concerns on the hilly and steep parts of the unit. This unit is well suited or moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation on the steeper parts of the unit.

This map unit is moderately suited or poorly suited to urban uses. The slope of both the major soils and the clayey subsoil of the Fullerton soils are the major limitations affecting these uses.

6. Townley-Montevallo

Rolling to very steep, well drained soils with a loamy surface layer and a loamy or clayey subsoil; on uplands underlain by shale

This map unit consists of rolling to very steep soils on upland ridges. The ridges typically have narrow, convex tops and long, convex side slopes.

This map unit makes up about 20 percent of the county. It is about 43 percent Townley soils, 29 percent Montevallo soils, and 28 percent soils of minor extent.

Townley soils are on the tops, shoulders, and sides of upland ridges. They are moderately deep soils with a loamy surface layer and a clayey subsoil.

Montevallo soils are on the tops, shoulders, and sides of upland ridges. They are shallow, loamy soils that have a high content of shale fragments throughout.

Of minor extent in this map unit are the moderately well drained Bellamy soils on foot slopes and Talbott and Bradyville soils on the adjacent uplands. Talbott and Bradyville soils formed in limestone and dolomite residuum.

Most areas of this map unit are used as woodland. Significant areas of the rolling and hilly soils have been cleared and are used for pasture or hay. This unit is poorly suited or unsuited to crop production and is moderately suited or poorly suited to pasture. The slope and the hazard of erosion are severe limitations affecting agricultural uses. This unit is moderately suited or poorly suited to woodland. The slope and the depth to bedrock cause a moisture deficiency and a severe erosion hazard during harvesting and reforestation.

This map unit is poorly suited to urban uses. The depth to bedrock and slope in areas of both the major soils and the clayey, slowly permeable subsoil of the Townley soils are serious limitations affecting these uses.

7. Wallen-Montevallo

Rolling to very steep, somewhat excessively drained and well drained soils that are loamy throughout; on uplands underlain by sandstone and shale, which are commonly interbedded

This map unit consists of steep and very steep soils on the top and side slopes of the main ridge of Log Mountain and undulating to very steep soils on shale uplands at the base of the ridge.

This map unit makes up about 3 percent of the county. It is about 44 percent Wallen soils, 39 percent Montevallo soils, and 17 percent soils of minor extent.

The rolling to very steep Wallen soils are on ridgetops and side slopes. They are moderately deep, somewhat excessively drained, loamy soils with a high content of rock fragments throughout.

The rolling to very steep Montevallo soils are on shale uplands. They are shallow, well drained, loamy soils with a high content of rock fragments throughout.

Of minor extent in this map unit are the shallow Opequon soils on ridgetops and side slopes and the very deep Bellamy soils on toe slopes and foot slopes.

Most of this map unit is used as woodland. Only small tracts of rolling and hilly soils have been cleared and are used for pasture or hay. Most of the unit is poorly suited to crop production because of the slope and the hazard of erosion. This unit is moderately suited or poorly suited to woodland. Erosion is a serious hazard during harvesting and reforestation on the steep and very steep soils. Additionally, the depth to bedrock and the high content of rock fragments cause a moisture deficiency and make it difficult for young stands to survive.

This map unit is poorly suited to urban uses. The depth to bedrock and the slope are serious limitations affecting these uses.

8. Talbott-Rock Outcrop-Bradyville

Areas of rolling to steep, well drained soils with a loamy surface layer and a clayey subsoil and areas with many limestone outcrops; on uplands underlain tilted bedrock

This map unit consists of rolling to very steep soils on uplands and prominent outcrops of limestone. Sinkholes and depressions are numerous, and there is not a well defined drainage pattern.

This map unit makes up about 13 percent of the county. It is about 36 percent Talbott soils, 33 percent Rock outcrop, 18 percent Bradyville soils, and 13 percent soils of minor extent.

The rolling to steep Talbott soils are on the tops, shoulders, and sides of upland ridges. They are moderately deep soils with a loamy surface layer and a clayey subsoil.

Rock outcrop is exposed limestone and dolomite bedrock. It commonly occurs as bands of individual rocks, ledges, or bluffs. Individual outcrops range from a few inches to several feet in height.

The rolling to steep Bradyville soils are on the broad tops and sides of upland ridges. They are deep soils with a loamy surface layer and a clayey subsoil.

Of minor extent in this map unit are the shallow Opequon and Montevallo soils on uplands.

Many areas of this map unit have been cleared and are used for pasture. This unit is poorly suited to crop production. The Rock outcrop is a severe limitation affecting cultivation and agricultural management. This unit is moderately suited to woodland. The Rock outcrop and the slope cause an equipment limitation and an erosion hazard during harvesting and reforestation.

This map unit is poorly suited to urban uses. The Rock outcrop, the clayey, slowly permeable subsoil, and the depth to bedrock are the major limitations affecting these uses.

9. Opequon-Rock Outcrop

Areas of steep and very steep, well drained soils with a loamy surface layer and a clayey subsoil and areas with many limestone outcrops; on uplands underlain by limestone or shaly limestone

This map unit consists of steep and very steep soils on uplands and prominent outcrops of limestone. Loose surface stones are numerous on parts of the unit.

This map unit makes up about 6 percent of the county. It is about 56 percent Opequon soils, 23 percent Rock outcrop, and 21 percent soils of minor extent.

The steep and very steep Opequon soils are on the tops and sides of upland ridges. They are shallow soils with a loamy surface layer and a clayey subsoil.

Rock outcrop is exposed limestone and shaly limestone bedrock. It commonly occurs as bands of individual rocks, ledges, or bluffs. Individual outcrops range from a few inches to several feet in height.

Of minor extent in this map unit are the shallow Montevallo soils on shale uplands and the moderately deep Talbott soils on upland ridges.

Most of this map unit is used as woodland. Because of the slope, the Rock outcrop, and the depth to bedrock, the unit is poorly suited to agricultural uses, woodland management, and urban uses. Woodland is the most practical use of the unit.

10. Wallen-Rock Outcrop

Areas of steep and very steep, moderately deep, somewhat excessively drained soils that are loamy throughout and areas with common sandstone outcrops; on uplands underlain by sandstone

This map unit consists of steep and very steep soils on the ridgetops and southern side slopes of Clinch Mountain and prominent outcrops of coarse grained sandstone. Loose surface stones and boulders are numerous on parts of the unit.

This map unit makes up about 6 percent of the county. It is about 60 percent Wallen soils, 20 percent Rock outcrop, and 20 percent soils of minor extent.

Wallen soils are on the top and southern side slopes of the mountain. They are moderately deep, loamy soils that have a high content of rock fragments throughout.

Rock outcrop is exposed sandstone bedrock. It occurs mainly as individual rocks or ledges and in some areas as prominent bluffs. Individual outcrops range from a few inches to several feet in height.

Of minor extent in this map unit are the deep Jefferson soils in colluvial areas and the shallow Montevallo and moderately deep Townley soils on convex slopes.

Most of this map unit is used as woodland. Because of the slope, the Rock outcrop, and the depth to bedrock, the unit is poorly suited to agricultural uses, woodland management, and urban uses. Woodland is the most practical use of the unit.

Detailed Soil Map Units

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, Jefferson loam, 12 to 20 percent slopes, is a phase of the Jefferson 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. Townley-Montevallo complex, 12 to 20 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The Rock outcrop part of Wallen-Rock outcrop complex, 35 to 70 percent slopes, is an example.

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

BeC—Bellamy loam, 5 to 12 percent slopes

This soil is very deep, sloping, and moderately well drained. It is on scattered low terraces and foot slopes throughout the county. Slopes are smooth and convex. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 7 inches; brown loam

Subsurface layer:
7 to 13 inches; dark yellowish brown loam

Subsoil:
13 to 42 inches; yellowish brown clay loam
42 to 60 inches; strong brown clay loam

Included with this soil in mapping are small areas of Montevallo and Townley soils, which are on shale uplands. Montevallo soils have shale bedrock at a depth of 10 to 20 inches. Townley soils have more clay in the subsoil than the Bellamy soil and have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Bellamy soil—

Permeability: Moderately slow
Available water capacity: High
Reaction: Very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: 18 to 36 inches
Depth to bedrock: More than 60 inches

Almost all areas of this soil have been cleared and are used for pasture or hay. A few areas are used for row crops. This soil is moderately suited to row crops and small grain. Erosion is a severe hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. This soil is well suited to hay and pasture.

This soil is moderately suited to most urban uses. The limiting soil features are wetness and moderately slow permeability in the subsoil. Properly designing structures and facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass IIIe.

Bm—Bloomingdale silty clay loam, frequently flooded

This soil is very deep, nearly level, and poorly drained. It is on scattered low-lying flood plains throughout the county. Slopes range from 0 to 2 percent. Individual areas range from 5 to 50 acres in size.

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

Surface layer:
0 to 5 inches; grayish brown silty clay loam

Subsoil:
5 to 12 inches; light brownish gray silty clay loam
12 to 20 inches; light brownish gray silty clay

Substratum:
20 to 37 inches; light brownish gray clay
37 to 60 inches; light gray silty clay

Included with this soil in mapping are small areas of a soil with less clay and more sand in the subsoil. Also included are small areas of Hamblen soils, which are on flood plains, have less clay in the subsoil than the Bloomingdale soil, and are moderately well drained. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Bloomingdale soil—

Permeability: Moderate
Available water capacity: High
Reaction: Medium acid to neutral, except where the soil has been limed
Flooding: Frequent, brief, November to May
Depth to a seasonal high water table: 0 to 12 inches
Depth to bedrock: More than 60 inches

Almost all areas of this soil have been cleared and are used for pasture or hay. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. The hazard of flooding and wetness are the major limitations affecting crop production.

Because of the wetness and the frequent flooding, this soil is poorly suited to most urban uses and is unsuitable as a residential or commercial building site.

This soil is poorly suited to woodland. Flooding and wetness cause an equipment limitation during the wetter parts of the year. Seedling mortality is a management concern because of the flooding. Plant competition is a severe problem unless competing vegetation is controlled. The trees suitable for planting include American sycamore and sweetgum.

This soil is in land capability subclass IVw.

BrD2—Bradyville-Rock outcrop-Talbott complex, 5 to 20 percent slopes, eroded

The soils in this map unit are moderately deep or deep, sloping to moderately steep, and well drained. The unit is on limestone uplands, dominantly in the Richland Valley. It consists of Bradyville and Talbott soils and limestone outcrops so intermingled that they could not be separated at the scale selected for mapping. Slopes are convex and commonly are interrupted by bands of limestone outcrops. Individual areas range from 20 to 100 acres in size.

The Bradyville soil makes up about 50 percent of this map unit but ranges from 45 to 60 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Bradyville soil are as follows—

Surface layer:
0 to 3 inches; dark yellowish brown silt loam

Subsoil:
3 to 32 inches; yellowish red silty clay
32 to 51 inches; yellowish red clay

Bedrock:
51 inches; limestone

Limestone rock outcrops make up about 25 percent of this map unit but range from 20 to 30 percent of each mapped area. The outcrops occur as bands or as individual rocks, ledges, or bluffs. A few scattered loose stones are throughout the unit.

The Talbott soil makes up about 15 percent of this map unit but ranges from 10 to 20 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Talbott soil are as follows—

Surface layer:
0 to 3 inches; brown silty clay loam

Subsoil:
3 to 32 inches; yellowish red clay

Bedrock:
32 inches; limestone

Included in mapping are small areas of a soil that is more than 60 inches deep over bedrock and areas of a soil, near rock outcrops, that is less than 10 inches deep over bedrock. Also included are small areas of Opequon soils, which are in landscape positions similar to those of the Bradyville and Talbott soils and have limestone bedrock at a depth of 10 to 20 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 10 percent of this map unit.

Important properties and features of the Bradyville and Talbott soils—

Permeability: Moderately slow
Available water capacity: Bradyville—moderate; Talbott—low or moderate
Reaction: Generally, strongly acid or medium acid in the Bradyville soil and strongly acid to slightly acid in the Talbott soil, but less acid in the layer directly above bedrock and in the surface layer where the soils have been limed.
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Bradyville—40 to 60 inches; Talbott—20 to 40 inches

Most areas of these soils have been cleared and are used for pasture. These soils are moderately suited to pasture and poorly suited to row crops, small grain, and hay. Rock outcrops cause a significant equipment limitation, although there are small areas where the outcrops are less abundant. Erosion is a hazard on pastures unless a good vegetative cover is maintained.

These soils are poorly suited to most urban uses because of rock outcrops, the moderately slow permeability, and the clayey subsoil. The depth to bedrock is an additional limitation, especially in the Talbott soil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This unit is moderately suited to woodland. Rock outcrops limit the use of equipment. Plant competition is a management concern, but seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include black walnut, loblolly pine, and eastern redcedar.

This map unit is in land capability subclass VIs.

DeB2—Dewey silt loam, 2 to 5 percent slopes, eroded

This soil is very deep, gently sloping, and well drained. It is on ridgetops and flats south of the Richland Knobs and on limestone uplands in the Richland Valley. Slopes are smooth and convex. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 26 inches; red silty clay
26 to 62 inches; red clay

Included with this soil in mapping are small areas of Etowah and Minvale soils. Etowah soils are on foot slopes. They have less clay in the subsoil than the Dewey soil. Minvale soils are in the lower concave areas. They have less clay and a higher content of rock fragments in the subsoil than the Dewey soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Dewey soil—

Permeability: Moderate
Available water capacity: Moderate or high
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for crops, hay (fig. 2), or pasture. This soil is well suited to row crops, small grain, hay, and pasture. All of the crops, grasses, and legumes that are adapted to the local climate are suited to this soil. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is well suited to most urban uses. Restricted permeability is a moderate limitation on sites for septic tank absorption fields, and the clayey subsoil is a moderate limitation on sites for sanitary landfills. Properly designing these facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, loblolly pine, and eastern white pine.

This soil is in land capability subclass IIe.

DeC2—Dewey silt loam, 5 to 12 percent slopes, eroded

This soil is very deep, sloping, and well drained. It is on the upper side slopes and ridgetops south of the Richland Knobs and on limestone uplands in the Richland Valley. Slopes are smooth and convex. Individual areas range from 15 to 50 acres in size.

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

Surface layer:
0 to 6 inches; brown silt loam

Subsoil:
6 to 24 inches; red silty clay
24 to 62 inches; red clay

Included with this soil in mapping are small areas of Etowah and Minvale soils. Etowah soils are on foot slopes. They have less clay in the subsoil than the Dewey soil. Minvale soils are in the lower concave areas. They have less clay and a higher content of rock fragments in the subsoil than the Dewey soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Dewey soil—

Permeability: Moderate
Available water capacity: Moderate or high
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay or pasture. A few areas are used for crops. This soil is moderately suited to row crops and small grain. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. This soil is well suited to hay and pasture.

This soil is well suited or moderately suited to most urban uses. The limiting soil features are the slope and the clayey subsoil. Properly designing structures and facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, loblolly pine, and eastern white pine.

This soil is in land capability subclass IIIe.

DeE3—Dewey silty clay loam, 20 to 35 percent slopes, severely eroded

This soil is very deep, steep, and well drained. It is dominantly on side slopes south of the Richland Knobs. The side slopes have previously been gullied by erosion and subsequently managed so that erosion scars have, to a large extent, disappeared. Slopes are smooth and convex. Individual areas range from 5 to 50 acres in size.

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

Surface layer:

0 to 5 inches; reddish brown silty clay loam

Figure 2.—Hay in an area of Dewey silt loam, 2 to 5 percent slopes, eroded. Talbott and Bradyville soils and a tip of Cherokee Lake are in the background.

Subsoil:
5 to 20 inches; red silty clay
20 to 62 inches; red clay

Included with this soil in mapping are small areas of soils that have a surface layer of clay or silty clay, with or without gullies. These soils are in the areas that have been most severely scarred by past erosion. Also included are small areas of soils that are moderately eroded and have a thicker surface layer than that of the Dewey soil and small areas of Fullerton soils, which are on narrow ridgetops and the upper side slopes and have a higher content of chert throughout than the Dewey soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Dewey soil—

Permeability: Moderate
Available water capacity: Moderate or high
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Many areas of this soil have been cleared and are used for pasture, but a significant acreage is reverting to woodland. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity on this soil. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope. This limitation is so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include eastern white pine and eastern redcedar.

This soil is in land capability subclass VIe.

DtD—Dewey-Etowah complex, 12 to 20 percent slopes

The soils in this map unit are very deep, moderately steep, and well drained. They are dominantly on side slopes south of the Richland Knobs. The two soils occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex in areas of the Dewey soil and smooth and concave in areas of the Etowah soil. Individual areas range from 30 to 200 acres in size.

The Dewey soil makes up about 47 percent of this map unit but ranges from 45 to 55 percent of each mapped area. It is moderately eroded. Some subsoil material is mixed into the plow layer.

The typical sequence, depth, and composition of the layers in the Dewey soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 8 inches; yellowish red silty clay loam
8 to 24 inches; red silty clay
24 to 62 inches; red clay

The Etowah soil makes up about 42 percent of this map unit but ranges from 40 to 50 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Etowah soil are as follows—

Surface layer:
0 to 10 inches; brown silt loam

Subsurface layer:
10 to 20 inches; brown silt loam

Subsoil:
20 to 42 inches; yellowish red silty clay loam
42 to 62 inches; red silty clay

Included with these soils in mapping are small areas of Fullerton and Minvale soils. These included soils have a higher content of chert fragments throughout than the Dewey and Etowah soils. Fullerton soils are on narrow, convex ridgetops and the upper side slopes. Minvale soils are in the lower concave areas. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 11 percent of this map unit.

Important properties and features of the Dewey and Etowah soils—

Permeability: Moderate
Available water capacity: Dewey—moderate or high; Etowah—high
Reaction: Very strongly acid or strongly acid, except where the soils have been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of these soils have been cleared and are used for hay or pasture. These soils are poorly suited to row crops and small grain and are moderately suited to hay and pasture. Erosion is a severe hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. Good pasture management is needed to control erosion and maintain productivity.

These soils are moderately suited to most urban uses. The limiting soil features are the slope of both soils and the clayey subsoil in the Dewey soil. Properly designing structures and facilities can minimize the influence of the limiting features.

These soils are well suited to woodland. The slope moderately limits the safe operation of equipment. Plant competition is a management concern, but seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, loblolly pine, and eastern white pine.

This map unit is in land capability subclass IVe.

DtE—Dewey-Etowah complex, 20 to 35 percent slopes

The soils in this map unit are very deep, steep, and well drained. They are dominantly on side slopes south of the Richland Knobs. The two soils occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex in areas of the Dewey soil and smooth and concave in areas of the Etowah soil. Individual areas range from 25 to 100 acres in size.

The Dewey soil makes up about 65 percent of this map unit but ranges from 60 to 75 percent of each mapped area. It is moderately eroded. Some subsoil material is mixed into the plow layer.

The typical sequence, depth, and composition of the layers in the Dewey soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 8 inches; yellowish red silty clay loam
8 to 24 inches; red silty clay
24 to 62 inches; red clay

The Etowah soil makes up about 25 percent of this map unit but ranges from 20 to 30 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Etowah soil are as follows—

Surface layer:
0 to 10 inches; brown silt loam

Subsurface layer:
10 to 20 inches; brown silt loam

Subsoil:
20 to 42 inches; yellowish red silty clay loam
42 to 62 inches; red silty clay

Included with these soils in mapping are small areas of Fullerton and Minvale soils. These included soils have a higher content of chert fragments throughout than the Dewey and Etowah soils. Fullerton soils are on narrow, convex ridgetops and the upper side slopes. Minvale soils are in the lower concave areas. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 10 percent of this map unit.

Important properties and features of the Dewey and Etowah soils—

Permeability: Moderate
Available water capacity: Dewey—moderate or high; Etowah—high
Reaction: Very strongly acid or strongly acid, except where the soils have been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of these soils have been cleared and are used for pasture. A few small areas are used as woodland. These soils are unsuited to row crops and small grain and are poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

These soils are poorly suited to most urban uses because of the slope. The clayey subsoil is an additional limitation in areas of the Dewey soil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

These soils are moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, loblolly pine, and eastern white pine.

This map unit is in land capability subclass VIe.

Ek—Elk silt loam

This soil is very deep, nearly level, and well drained. It is on low stream terraces adjacent to the Holston River. Slopes range from 0 to 3 percent. Individual areas range from 10 to 50 acres in size.

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

Surface layer:
0 to 8 inches; brown silt loam

Subsurface layer:
8 to 17 inches; dark yellowish brown silt loam

Subsoil:
17 to 42 inches; yellowish brown silty clay loam

Substratum:
42 to 60 inches; dark yellowish brown silty clay loam

Included with this soil in mapping are small areas of a soil that has less clay and more sand in the subsoil. This included soil is on the natural levees of rivers. Also included are small areas of Shady soils in the slightly higher positions on the terraces. Shady soils have more sand in the subsoil than the Elk soil and are more acid throughout. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Elk soil—

Permeability: Moderate
Available water capacity: High
Reaction: Strongly acid to slightly acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for crops, hay, or pasture. This soil is well suited to row crops, small grain, hay, and pasture. All of the crops, grasses, and legumes that are adapted to the local climate are suited to this soil.

This soil is well suited to most urban uses. Few significant limitations affect urban development. Low strength is a limitation on sites for local roads and streets.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, northern red oak, and eastern white pine.

This soil is in land capability class I.

EtB—Etowah silt loam, 2 to 5 percent slopes

This soil is very deep, gently sloping, and well drained. It is dominantly on foot slopes and benches in the southern half of the county. Slopes are smooth and concave. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 10 inches; brown silt loam

Subsurface layer:
10 to 20 inches; brown silt loam

Subsoil:
20 to 42 inches; yellowish red silty clay loam
42 to 60 inches; red silty clay

Included with this soil in mapping are small areas of a soil with less clay in the subsoil and a higher content of chert fragments throughout. This included soil is in narrow drainageways. Also included are small areas of Dewey soils on side slopes in the uplands. Dewey soils have more clay in the subsoil than the Etowah soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Etowah soil—

Permeability: Moderate
Available water capacity: High
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for crops, hay, or pasture. This soil is well suited to row crops, small grain, hay, and pasture. All of the crops, grasses, and legumes that are adapted to the local climate are suited to this soil. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is well suited to most urban uses. Moderate limitations affect a few uses, but they generally can be easily overcome.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass IIe.

EtC—Etowah silt loam, 5 to 12 percent slopes

This soil is very deep, sloping, and well drained. It is dominantly in areas of foot slopes, benches, and concave slopes on uplands in the southern half of the county. Slopes are smooth and concave. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 10 inches; brown silt loam

Subsurface layer:
10 to 20 inches; brown silt loam

Subsoil:
20 to 42 inches; yellowish red silty clay loam
42 to 60 inches; red silty clay

Included with this soil in mapping are small areas of a soil with less clay in the subsoil and a higher content of chert fragments throughout. This included soil is in narrow drainageways. Also included are small areas of Dewey soils on side slopes in the uplands. Dewey soils have more clay in the subsoil than the Etowah soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Etowah soil—

Permeability: Moderate
Available water capacity: High
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Almost all areas of this soil have been cleared and are used for hay or pasture. Some areas are used for crops. This soil is moderately suited to row crops and small grain and is well suited to hay and pasture. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is well suited or moderately suited to most urban uses. The limiting soil features are a moderately permeable subsoil and the slope. Properly designing structures and facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass IIIe.

FuC2—Fullerton gravelly loam, 5 to 12 percent slopes, eroded

This soil is very deep, sloping, and well drained. It is on ridgetops and is dominantly north of Clinch Mountain. Slopes are smooth and convex. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 5 inches; brown gravelly loam

Subsoil:
5 to 60 inches; red gravelly clay

Included with this soil in mapping are small areas of Dewey, Etowah, and Minvale soils. Dewey soils are on uplands. They have fewer rock fragments in the subsoil than the Fullerton soil. Etowah soils are in concave areas. They have less clay and fewer rock fragments in the subsoil than the Fullerton soil. Minvale soils are in coves and on foot slopes. They have less clay in the subsoil than the Fullerton soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Fullerton soil—

Permeability: Moderate
Available water capacity: Moderate
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay or pasture. This soil is moderately suited to row crops and small grain and is well suited to hay and pasture (fig. 3). Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is moderately suited to most urban uses. The limiting soil features are the slope and the clayey subsoil. Properly designing structures and facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass IIIe.

FuD2—Fullerton gravelly loam, 12 to 20 percent slopes, eroded

This soil is very deep, moderately steep, and well drained. It is on ridgetops and side slopes and is dominantly north of Clinch Mountain. Slopes are smooth and convex. Individual areas range from 25 to 200 acres in size.

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

Surface layer:
0 to 5 inches; brown gravelly loam

Subsoil:
5 to 60 inches; red gravelly clay

Included with this soil in mapping are small areas of Dewey, Etowah, and Minvale soils. Dewey soils are on uplands. They have fewer rock fragments in the subsoil than the Fullerton soil. Etowah soils are in concave areas. They have less clay and fewer rock fragments in the subsoil than the Fullerton soil. Minvale soils are in coves and on foot slopes. They have less clay in the subsoil than the Fullerton soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Fullerton soil—

Figure 3.—An area of Fullerton gravelly loam, 5 to 12 percent slopes, eroded, which is moderately suited to row crops and well suited to pasture. Bellamy, Montevallo, and Townley soils are in the background.

Permeability: Moderate
Available water capacity: Moderate
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay or pasture. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. Erosion is a severe hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. Good pasture management is needed to control erosion and maintain productivity.

This soil is poorly suited to most urban uses because of the slope and the clayey subsoil. These limitations are so severe that there is significant expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes a moderate erosion hazard during harvesting and reforestation and limits the safe operation of equipment. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass IVe.

FuE2—Fullerton gravelly loam, 20 to 35 percent slopes, eroded

This soil is very deep, steep, and well drained. It is on side slopes in the uplands and is dominantly north of Clinch Mountain. Slopes are smooth and convex. Individual areas range from 25 to 250 acres in size.

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

Surface layer:
0 to 5 inches; brown gravelly loam

Subsoil:
5 to 60 inches; red gravelly clay

Included with this soil in mapping are small areas of Dewey, Etowah, and Minvale soils. Dewey soils are on uplands. They have fewer rock fragments in the subsoil than the Fullerton soil. Etowah soils are in concave areas. They have less clay and fewer rock fragments in the subsoil than the Fullerton soil. Minvale soils are in coves and on foot slopes. They have less clay in the subsoil than the Fullerton soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Fullerton soil—

Permeability: Moderate
Available water capacity: Moderate
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil are used as woodland. Some areas have been cleared and are used for pasture. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope and the clayey subsoil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar and loblolly pine.

This soil is in land capability subclass VIe.

Ha—Hamblen silt loam, frequently flooded

This soil is very deep, nearly level, and moderately well drained. It is on scattered flood plains throughout the county. Slopes range from 0 to 2 percent. Individual areas range from 5 to 20 acres in size.

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

Surface layer:
0 to 8 inches; dark brown silt loam

Subsoil:
8 to 17 inches; dark yellowish brown silty clay loam
17 to 55 inches; yellowish brown and brown loam

Substratum:
55 to 65 inches; dark gray loam

Included with this soil in mapping are small areas of a soil that has more sand and fewer mottles in the subsoil and small areas of a soil that has less sand and more clay in the subsoil. Also included are small areas of the poorly drained Bloomingdale soils in the lower positions and depressions on the flood plains. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Hamblen soil—

Permeability: Moderate
Available water capacity: High
Reaction: Neutral to strongly acid
Flooding: Frequent, very brief, December to March
Depth to a seasonal high water table: 24 to 36 inches
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for pasture or hay. Some small tracts are used for row crops. This soil is moderately suited to row crops and small grain. The hazard of flooding and wetness are the major limitations affecting crop production. This soil is well suited to pasture and hay.

Because of the frequent flooding, this soil is poorly suited to most urban uses and is unsuitable as a residential or commercial building site.

This soil is moderately suited to woodland. Seedling mortality is a hazard because of the frequent flooding. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include loblolly pine and yellow-poplar.

This soil is in land capability subclass IIIw.

JeC—Jefferson loam, 5 to 12 percent slopes

This soil is very deep, sloping, and well drained. It is on foot slopes (fig. 4), benches, and toe slopes in Poor Valley and on Clinch Mountain. Slopes are smooth and concave. Individual areas range from 50 to 150 acres in size.

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

Surface layer:
0 to 6 inches; brown loam

Subsurface layer:
6 to 16 inches; light yellowish brown silt loam

Subsoil:
16 to 51 inches; yellowish brown clay loam
51 to 60 inches; mottled clay loam

Included with this soil in mapping are small areas of Sewanee and Wallen soils. Sewanee soils are on flood plains. They have less clay in the subsoil than the Jefferson soil and are moderately well drained. Wallen soils are on uplands. They have more rock fragments in the subsoil than the Jefferson soil and have bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Jefferson soil—

Permeability: Moderately rapid
Available water capacity: Moderate or high
Reaction: Generally, very strongly acid or strongly acid, but ranging to neutral in the surface layer
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay or pasture. This soil is moderately suited to row crops and small grain and is well suited to hay and pasture. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is well suited or moderately suited to most urban uses. The slope is a limiting soil feature. Properly designing structures and facilities can minimize the influence of this limiting feature.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, white oak, and eastern white pine.

This soil is in land capability subclass IIIe.

JeD—Jefferson loam, 12 to 20 percent slopes

This soil is very deep, moderately steep, and well drained. It is on foot slopes, benches, and toe slopes and in coves in Poor Valley and on Clinch Mountain. Slopes are smooth and concave. Individual areas range from 50 to 150 acres in size.

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

Surface layer:
0 to 6 inches; brown loam

Subsurface layer:
6 to 16 inches; light yellowish brown silt loam

Figure 4.—An area of Jefferson loam, 5 to 12 percent slopes, which commonly is in long, narrow areas on foot slopes.

Subsoil:
16 to 51 inches; yellowish brown clay loam
51 to 60 inches; mottled clay loam

Included with this soil in mapping are small areas of a soil having a high content of cobbles and boulders. This included soil is in narrow, steep drainageways. Also included are small areas of Sewanee and Wallen soils. Sewanee soils are on flood plains. They have less clay in the subsoil than the Jefferson soil and are moderately well drained. Wallen soils are on uplands. They have more rock fragments in the subsoil than the Jefferson soil and have bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Jefferson soil—

Permeability: Moderately rapid
Available water capacity: Moderate or high
Reaction: Generally, very strongly acid or strongly acid, but ranging to neutral in the surface layer
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of in this soil are used as woodland or pasture. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. Erosion is a severe hazard when cultivated crops are grown. Good pasture management is needed to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is moderately suited or poorly suited to most urban uses because of the slope. This limitation results in moderate expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, shortleaf pine, and eastern white pine.

This soil is in land capability subclass IVe.

JeE—Jefferson loam, 20 to 35 percent slopes

This soil is very deep, steep, and well drained. It is on foot slopes and toe slopes and in coves in Poor Valley and on Clinch Mountain. Slopes are smooth and concave. Individual areas range from 50 to 150 acres in size.

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

Surface layer:
0 to 6 inches; brown loam

Subsurface layer:
6 to 16 inches; light yellowish brown silt loam

Subsoil:
16 to 51 inches; yellowish brown clay loam
51 to 60 inches; mottled clay loam

Included with this soil in mapping are small areas of a soil having a high content of cobbles and boulders. This included soil is in narrow, steep drainageways. Also included are small areas of Wallen soils on uplands. Wallen soils have more rock fragments in the subsoil than the Jefferson soil and have bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Jefferson soil—

Permeability: Moderately rapid
Available water capacity: Moderate or high
Reaction: Generally, very strongly acid or strongly acid, but ranging to neutral in the surface layer
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil are used as woodland. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope. This limitation is so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, shortleaf pine, and eastern white pine.

This soil is in land capability subclass VIe.

MnD—Minvale loam, 12 to 20 percent slopes

This soil is very deep, moderately steep, and well drained. It is in scattered areas in coves and on foot slopes and benches throughout the county. Slopes are smooth and concave. Individual areas range from 25 to 150 acres in size.

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

Surface layer:
0 to 5 inches; brown loam

Subsurface layer:
5 to 8 inches; light yellowish brown gravelly loam
8 to 14 inches; yellowish brown gravelly loam

Subsoil:
14 to 36 inches; yellowish brown gravelly silty clay loam
36 to 60 inches; strong brown gravelly silty clay loam

Included with this soil in mapping are small areas of Dewey, Etowah, and Fullerton soils. Dewey soils are on limestone uplands. They have more clay and fewer rock fragments in the subsoil than the Minvale soil. Etowah soils are in concave areas. They have fewer rock fragments in the subsoil than the Minvale soil. Fullerton soils are on uplands. They have more clay in the subsoil than the Minvale soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Minvale soil—

Permeability: Moderate
Available water capacity: Moderate or high
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for pasture or hay. This soil is poorly suited to row crops and small grain. Erosion is a severe hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. This soil is moderately suited to hay and pasture. Good pasture management is needed to control erosion and maintain productivity.

This soil is moderately suited to most urban uses. The most limiting soil feature is the slope. Properly designing structures and facilities can minimize the influence of this limiting feature.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, and loblolly pine.

This soil is in land capability subclass IVe.

MnE—Minvale loam, 20 to 35 percent slopes

This soil is very deep, steep, and well drained. It is in scattered areas in coves and on foot slopes throughout the county. Slopes are smooth and concave. Individual areas range from 50 to 250 acres in size.

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

Surface layer:
0 to 5 inches; brown loam

Subsurface layer:
5 to 8 inches; light yellowish brown gravelly loam
8 to 14 inches; yellowish brown gravelly loam

Subsoil:
14 to 36 inches; yellowish brown gravelly silty clay loam
36 to 60 inches; strong brown gravelly silty clay loam

Included with this soil in mapping are small areas of Dewey, Etowah, and Fullerton soils. Dewey soils are on limestone uplands. They have more clay and fewer rock fragments in the subsoil than the Minvale soil. Etowah soils are in concave areas. They have fewer rock fragments in the subsoil than the Minvale soil. Fullerton soils are on uplands. They have more clay in the subsoil than the Minvale soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Minvale soil—

Permeability: Moderate
Available water capacity: Moderate
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil are used as woodland. Some areas have been cleared and are used for pasture. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope. This limitation is so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, and loblolly pine.

This soil is in land capability subclass VIe.

MoC—Montevallo channery silt loam, 5 to 12 percent slopes

This soil is shallow, sloping, and well drained. It is on scattered shale uplands throughout the county. Slopes are smooth and convex. Individual areas range from 10 to 100 acres in size.

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

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with this soil in mapping are small areas of a soil having more clay and fewer rock fragments in the subsoil and a severely eroded soil that is less than 10 inches deep over bedrock. Also included are small areas of Opequon and Townley soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Montevallo soil and have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Montevallo soil—

Permeability: Moderate
Available water capacity: Very low
Reaction: Very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 10 to 20 inches

Most areas of this soil have been cleared and are used for hay or pasture. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. Erosion is a severe hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth. Good pasture management is needed to control erosion and maintain productivity.

This soil is poorly suited to most urban uses because of the depth to bedrock. This limitation is so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. Seedling mortality is a problem because of the depth to bedrock and the very low available water capacity. Windthrow is a problem because of a shallow root zone. The trees suitable for planting include loblolly pine, shortleaf pine, and Virginia pine.

This soil is in land capability subclass IVe.

MoD—Montevallo channery silt loam, 12 to 20 percent slopes

This soil is shallow, moderately steep, and well drained. It is on scattered shale uplands throughout the county. Slopes are smooth and convex. Individual areas range from 10 to 100 acres in size.

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

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with this soil in mapping are small areas of a soil having more clay and fewer rock fragments in the subsoil and a severely eroded soil that is less than 10 inches deep over bedrock. Also included are small areas of Opequon and Townley soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Montevallo soil and have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Montevallo soil—

Permeability: Moderate
Available water capacity: Very low
Reaction: Very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 10 to 20 inches

Most areas of this soil are used as woodland. Several areas have been cleared and are used for pasture. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. Good pasture management is needed to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. Seedling mortality is a problem because of the depth to bedrock and the very low available water capacity. Windthrow is a problem because of a shallow root zone. The slope causes an erosion hazard and limits the safe operation of equipment. The trees suitable for planting include loblolly pine, shortleaf pine, and Virginia pine.

This soil is in land capability subclass VIe.

MoE—Montevallo channery silt loam, 20 to 35 percent slopes

This soil is shallow, steep, and well drained. It is on scattered shale uplands throughout the county. Slopes are smooth and convex. Individual areas range from 10 to 100 acres in size.

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

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with this soil in mapping are small areas of a soil having more clay and fewer rock fragments in the subsoil and a severely eroded soil that is less than 10 inches deep over bedrock. Also included are small areas of Opequon and Townley soils. Opequon soils are on limestone uplands. They have limestone bedrock at a depth of 10 to 20 inches. Townley soils are on shale uplands. They have more clay and fewer rock fragments in the subsoil than the Montevallo soil and have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Montevallo soil—

Permeability: Moderate
Available water capacity: Very low
Reaction: Very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 10 to 20 inches

Most areas of this soil are used as woodland. This soil is unsuited to row crops, small grain, and hay and is poorly suited to pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is unsuited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that another site should be selected.

This soil is poorly suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment. The depth to bedrock causes a windthrow hazard in established stands. It also causes an inadequate moisture supply, which results in seedling mortality. The trees suitable for planting include loblolly pine, shortleaf pine, and Virginia pine.

This soil is in land capability subclass VIIe.

MoF—Montevallo channery silt loam, 35 to 60 percent slopes

This soil is shallow, very steep, and well drained. It is on scattered shale uplands throughout the county. Slopes are smooth and convex. Individual areas range from 10 to 100 acres in size.

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

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with this soil in mapping are small areas of a soil having more clay and fewer rock fragments in the subsoil and a severely eroded soil that is less than 10 inches deep over bedrock. Also included are small areas of Opequon and Townley soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Montevallo soil and have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Montevallo soil—

Permeability: Moderate
Available water capacity: Very low
Reaction: Very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 10 to 20 inches

Most areas of this soil are used as woodland. This soil is unsuited to row crops, small grain, and hay and is poorly suited to pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is unsuited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that another site should be selected.

This soil is poorly suited to woodland. The slope causes a severe erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. The depth to bedrock causes a windthrow hazard in established stands. It also causes an inadequate moisture supply, which results in seedling mortality. The trees suitable for planting include loblolly pine, shortleaf pine, and Virginia pine.

This soil is in land capability subclass VIIe.

OpE—Opequon-Rock outcrop complex, 20 to 60 percent slopes

This map unit consists of an Opequon soil and limestone outcrops on the top and side slopes of scattered upland ridges throughout the county. The Opequon soil is shallow, is steep and very steep, and is well drained. The Opequon soil and the limestone outcrops occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 50 to 300 acres in size.

The Opequon soil makes up about 53 percent of this map unit but ranges from 50 to 60 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Opequon soil are as follows—

Surface layer:
0 to 2 inches; brown silty clay loam

Subsoil:
2 to 17 inches; yellowish brown silty clay

Bedrock:
17 inches; hard shaly limestone

Limestone outcrops make up about 27 percent of this map unit but range from 20 to 30 percent of each mapped area. These outcrops occur as individual rocks, ledges, or bluffs. Some scattered loose flagstones and boulders are throughout the unit.

Included in this unit in mapping are areas of Talbott and Townley soils. Talbott soils are in landscape position similar to those of the Opequon soil. They are more than 20 inches deep over limestone bedrock. Townley soils have shale bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 20 percent of this map unit.

Important properties and features of the Opequon soil—

Permeability: Moderate or moderately slow
Available water capacity: Low or very low
Reaction: Neutral or mildly alkaline
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 12 to 20 inches

Most areas of this map unit are used as woodland. This unit is unsuited to row crops, small grain, and hay and is poorly suited to pasture. The slope, the rock outcrops, and the depth to bedrock cause a severe erosion hazard and an equipment limitation on this unit.

This map unit is unsuited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that another site should be selected.

This map unit is poorly suited to woodland. The slope causes a severe erosion hazard during harvesting and reforestation. The slope and the rock outcrops limit the safe operation of equipment and the types of equipment that can be used. The depth to bedrock causes a windthrow hazard in established stands. It also causes droughtiness, which results in a high seedling mortality rate. The trees suitable for planting include Virginia pine and eastern white pine.

This map unit is in land capability subclass VIIs.

Se—Sewanee loam, occasionally flooded

This soil is deep, nearly level, and moderately well drained. It is on flood plains in Poor Valley. Slopes range from 0 to 3 percent. Individual areas range from 5 to 30 acres in size.

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

Surface layer:
0 to 4 inches; brown loam

Subsoil:
4 to 33 inches; dark yellowish brown fine sandy loam

Substratum:
33 to 50 inches; light brownish gray sandy loam

Bedrock:
50 inches; unweathered, dark colored shale

Included with this soil in mapping are small areas of Bloomingdale and Jefferson soils. Bloomingdale soils are in depressions and on the lower flood plains and are poorly drained. Jefferson soils are on foot slopes and benches. They have more clay and less sand in the subsoil than the Sewanee soil and are well drained. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Sewanee soil—

Permeability: Moderate
Available water capacity: High
Reaction: Very strongly acid or strongly acid, except where the soil has been limed
Flooding: Occasional, very brief, December to March
Depth to a seasonal high water table: 18 to 30 inches
Depth to bedrock: More than 40 inches

Most areas of this soil are used as woodland. A few small areas have been cleared and are used for row crops or for hay or pasture. Where cleared, this soil can produce good yields of most crops, but it is poorly suited to crops because it occurs as narrow strips adjacent to steeper soils that are used as woodland.

Because of the flooding, this soil is poorly suited to most urban uses and is unsuitable as a residential or commercial building site.

This soil is well suited to woodland. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, loblolly pine, and eastern white pine.

This soil is in land capability subclass IIw.

ShB—Shady loam, 1 to 4 percent slopes

This soil is very deep, is nearly level and gently sloping, and is well drained. It is on low stream terraces adjacent to the Holston River. Slopes are smooth and convex. Individual areas range from 10 to 50 acres in size.

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

Surface layer:
0 to 7 inches; brown loam

Subsoil:
7 to 15 inches; dark yellowish brown clay loam
15 to 45 inches; strong brown sandy clay loam

Substratum:
45 to 60 inches; strong brown sandy loam

Included with this soil in mapping are small areas of a soil that has less clay in the subsoil. This included soil is on natural levees near the river. Also included are small areas of Hamblen and Elk soils. Hamblen soils are in depressions and drainageways and are moderately well drained. Elk soils are adjacent to limestone bluffs and outcrops. They have more silt and are less acid throughout than the Shady soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Shady soil—

Permeability: Moderate
Available water capacity: High
Reaction: Strongly acid or medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Almost all areas of this soil have been cleared and are used for row crops, hay, or pasture. This soil is well suited to row crops, small grain, hay, and pasture. It is suited to all of the crops, grasses, and legumes commonly grown in the county. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is well suited to most urban uses. The limitations that affect urban development generally can be easily overcome.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include black walnut, yellow-poplar, and loblolly pine.

This soil is in land capability subclass IIe.

TbD2—Talbott-Rock outcrop-Bradyville complex, 5 to 20 percent slopes, eroded

This map unit consists of Talbott and Bradyville soils and limestone outcrops on scattered limestone uplands throughout the county. The Talbott and Bradyville soils are moderately deep or deep, are sloping to moderately steep, and are well drained. The two soils and the limestone outcrops occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are convex and commonly are interrupted by bands of rock outcrops. Both of the soils are eroded and in some areas are severely eroded. Individual areas of this unit range from 50 to 400 acres in size.

The Talbott soil makes up about 38 percent of this map unit but ranges from 33 to 43 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Talbott soil are as follows—

Surface layer:
0 to 3 inches; brown silty clay loam

Subsoil:
3 to 27 inches; yellowish red clay

Substratum:
27 to 32 inches; mottled red and yellowish brown clay

Bedrock:
32 inches; limestone

Limestone outcrops make up about 35 percent of this map unit but range from 23 to 47 percent of each mapped area. The outcrops occur in bands or as individual rocks, ledges, or bluffs. Some scattered loose stones and boulders are throughout the unit.

The Bradyville soil makes up about 18 percent of this map unit but ranges from 12 to 23 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Bradyville soil are as follows—

Surface layer:
0 to 3 inches; dark yellowish brown silt loam

Subsoil:
3 to 32 inches; yellowish red silty clay
32 to 51 inches; yellowish red clay

Bedrock:
51 inches; limestone

Included in this unit in mapping are small areas of a soil that is less than 10 inches deep over bedrock. This soil is near the rock outcrops. Also included are small areas of Opequon soils, which have limestone bedrock at a depth of 10 to 20 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 9 percent of this map unit.

Important properties and features of the Talbott and Bradyville soils—

Permeability: Moderately slow;
Available water capacity: Talbott—low or moderate; Bradyville—moderate
Reaction: Generally, strongly acid to slightly acid in the Talbott soil and strongly acid or medium acid in the Bradyville soil, but ranging to mildly alkaline in the layer directly above bedrock
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Talbott—20 to 40 inches; Bradyville—40 to 60 inches

Most areas of this map unit have been cleared and are used for pasture. This unit is poorly suited to crop production. The rock outcrops cause a severe equipment limitation. Erosion is a severe hazard on pastures unless a good vegetative cover is maintained.

This map unit is poorly suited to most urban uses because of the rock outcrops and the clayey subsoil. The depth to bedrock is an additional limitation in areas of the Talbott soil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This map unit is moderately suited to woodland. The rock outcrops cause an equipment limitation. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include loblolly pine, shortleaf pine, and eastern redcedar.

This map unit is in land capability subclass VIs.

TbE2—Talbott-Rock outcrop-Bradyville complex, 20 to 50 percent slopes, eroded

This map unit consists of Talbott and Bradyville soils and limestone outcrops on scattered limestone uplands throughout the county. The Talbott and Bradyville soils are moderately deep or deep, are steep, and are well drained. The Bradyville soil has slopes of 20 to 30 percent. The two soils and the outcrops occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are convex and are commonly interrupted by bands of rock outcrops. Individual areas of this unit range from 10 to 200 acres in size.

The Talbott soil makes up about 38 percent of this map unit but ranges from 33 to 43 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Talbott soil are as follows—

Surface layer:
0 to 3 inches; brown silty clay loam

Subsoil:
3 to 27 inches; yellowish red clay

Substratum:
27 to 32 inches; mottled red and yellowish brown clay

Bedrock:
32 inches; limestone

Limestone rock outcrops make up about 35 percent of this map unit but range from 23 to 47 percent of each mapped area. The outcrops occur in bands or as individual rocks, ledges, or bluffs. Some scattered loose stones and boulders are throughout the unit.

The Bradyville soil makes up about 18 percent of this map unit but ranges from 12 to 23 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Bradyville soil are as follows—

Surface layer:
0 to 3 inches; dark yellowish brown silt loam

Subsoil:
3 to 32 inches; yellowish red silty clay
32 to 51 inches; yellowish red clay

Bedrock:
51 inches; limestone

Included in this unit in mapping are small areas of a soil that is less than 10 inches deep over bedrock. This soil is near the rock outcrops. Also included are small areas of Opequon soils, which have limestone bedrock at a depth of 10 to 20 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 9 percent of this map unit.

Important properties and features of the Talbott and Bradyville soils—

Permeability: Moderately slow
Available water capacity: Talbott—low or moderate; Bradyville—moderate
Reaction: Talbott—strongly acid to slightly acid, except where the soil has been limed; Bradyville—strongly acid or medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Talbott—20 to 40 inches; Bradyville—40 to 60 inches

Most areas of this map unit are used as pasture or woodland. This unit is not suited to crops. The rock outcrops and the slope are severe limitations affecting crop production.

This map unit is poorly suited to most urban uses because of the rock outcrops, the slope, and the clayey subsoil. The depth to bedrock is an additional limitation in areas of the Talbott soil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This map unit is moderately suited to woodland. The rock outcrops and the slope cause a severe equipment limitation. Also, the slope causes an erosion hazard during harvesting and reforestation. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include shortleaf pine, loblolly pine, and eastern redcedar.

This map unit is in land capability subclass VIIs.

TeC—Townley silt loam, 5 to 12 percent slopes

This soil is moderately deep, sloping, and well drained. It is on scattered shale uplands throughout the county. Slopes are smooth and convex. Individual areas range from 10 to 100 acres in size.

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

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 9 inches; brown clay
9 to 17 inches; yellowish red clay
17 to 28 inches; yellowish red channery clay

Substratum:
28 to 33 inches; yellowish red extremely channery clay

Bedrock:
33 to 50 inches; tilted and fractured shale

Included with this soil in mapping are small areas of a soil that is more than 40 inches deep over bedrock and has less clay in the subsoil. This included soil is in concave areas. Also included are small areas of Montevallo soils, which are on narrow, convex ridgetops and have shale bedrock at a depth of 10 to 20 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Townley soil—

Permeability: Slow
Available water capacity: Moderate or low
Reaction: Extremely acid to strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: more than 6 feet
Depth to bedrock: 20 to 40 inches

Most areas of this soil have been cleared and are used for pasture or hay. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. The moderate depth to bedrock and the clayey subsoil limit the available water capacity and retard the movement of air and water in the root zone. Erosion is a severe hazard when cultivated crops are grown. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the depth to bedrock and a slowly permeable subsoil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. Windthrow is a hazard because of a limited rooting depth. The clayey subsoil causes a moderate equipment limitation because it has low strength when wet. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include loblolly pine and Virginia pine.

This soil is in land capability subclass IVe.

TmD—Townley-Montevallo complex, 12 to 20 percent slopes

The soils in this map unit are shallow or moderately deep, are moderately steep, and are well drained. They are on scattered shale uplands throughout the county. The two soils occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 20 to 100 acres in size.

The Townley soil makes up about 55 percent of this map unit but ranges from 50 to 60 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Townley soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 9 inches; brown clay
9 to 17 inches; yellowish red clay
17 to 28 inches; yellowish red channery clay

Substratum:
28 to 33 inches; yellowish red extremely channery clay

Bedrock:
33 to 50 inches; tilted and fractured shale

The Montevallo soil makes up about 35 percent of this map unit but ranges from 30 to 40 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Montevallo soil are as follows—

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with these soils in mapping are small areas of a severely eroded soil that is less than 10 inches deep over shale bedrock. Also included are small areas of Opequon and Talbott soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Talbott soils have limestone bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 10 percent of this map unit.

Important properties and features of the Townley and Montevallo soils—

Permeability: Townley—slow; Montevallo—moderate
Available water capacity: Townley—moderate or low; Montevallo—very low
Reaction: Townley—extremely acid to strongly acid, except where the soil has been limed; Montevallo—very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Townley—20 to 40 inches; Montevallo—10 to 20 inches

Many areas of these soils are used as woodland. Several areas have been cleared and are used for pasture. The soils are unsuited to row crops and small grain and are poorly suited to hay and pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

These soils are poorly suited to most urban uses because of the slope and the depth to bedrock. The slowly permeable subsoil is an additional limitation in areas of the Townley soil. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

These soils are moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Windthrow is a hazard because of a limited rooting depth. Seedling mortality is a management concern because of droughtiness, which is more severe on south- and west-facing slopes than on north- and east-facing slopes. The trees suitable for planting include loblolly pine and Virginia pine.

This map unit is in land capability subclass VIe.

TmE—Townley-Montevallo complex, 20 to 35 percent slopes

The soils in this map unit are shallow or moderately deep, are steep, and are well drained. They are on scattered shale uplands throughout the county. The two soils occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 50 to 200 acres in size.

The Townley soil makes up about 55 percent of this map unit but ranges from 50 to 60 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Townley soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 9 inches; brown clay
9 to 17 inches; yellowish red clay
17 to 28 inches; yellowish red channery clay

Substratum:
28 to 33 inches; yellowish red extremely channery clay

Bedrock:
33 to 50 inches; tilted and fractured shale

The Montevallo soil makes up about 35 percent of this map unit but ranges from 30 to 40 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Montevallo soil are as follows—

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with these soils in mapping are small areas of a severely eroded soil that is less than 10 inches deep over shale bedrock. Also included are small areas of Opequon and Talbott soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Talbott soils have limestone bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 10 percent of this map unit.

Important properties and features of the Townley and Montevallo soils—

Permeability: Townley—slow; Montevallo—moderate
Available water capacity: Townley—moderate or low; Montevallo—very low
Reaction: Townley—extremely acid to strongly acid, except where the soil has been limed; Montevallo—very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Townley—20 to 40 inches; Montevallo—10 to 20 inches

Most areas of these soils are used as woodland. The soils are unsuited to row crops, small grain, and hay and are poorly suited to pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

These soils are poorly suited to most urban uses because of the slope and the depth to bedrock. The slowly permeable subsoil is an additional limitation in areas of the Townley soil. Because of the severity of these limitations, an alternative site generally should be selected.

These soils are moderately suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Seedling mortality is a management concern because of droughtiness, which is more severe on south- and west-facing slopes than on north- and east-facing slopes. Windthrow is a hazard because of a limited rooting depth. The trees suitable for planting include loblolly pine and Virginia pine.

This map unit is in land capability subclass VIIe.

TmF—Townley-Montevallo complex, 35 to 60 percent slopes

The soils in this map unit are shallow or moderately deep, are very steep, and are well drained. They are on scattered shale uplands throughout the county. The two soils occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 50 to 200 acres in size.

The Townley soil makes up about 55 percent of this map unit but ranges from 50 to 60 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Townley soil are as follows—

Surface layer:
0 to 4 inches; brown silt loam

Subsoil:
4 to 9 inches; brown clay
9 to 17 inches; yellowish red clay
17 to 28 inches; yellowish red channery clay

Substratum:
28 to 33 inches; yellowish red extremely channery clay

Bedrock:
33 to 50 inches; tilted and fractured shale

The Montevallo soil makes up about 35 percent of this map unit but ranges from 30 to 40 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Montevallo soil are as follows—

Surface layer:
0 to 2 inches; brown channery silt loam

Subsoil:
2 to 13 inches; brownish yellow very channery silt loam

Substratum:
13 to 18 inches; brownish yellow extremely channery silt loam

Bedrock:
18 to 40 inches; tilted and fractured shale

Included with these soils in mapping are small areas of a severely eroded soil that is less than 10 inches deep over shale bedrock. Also included are small areas of Opequon and Talbott soils. Opequon soils have limestone bedrock at a depth of 10 to 20 inches. Talbott soils have limestone bedrock at a depth of 20 to 40 inches. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 10 percent of this map unit.

Important properties and features of the Townley and Montevallo soils—

Permeability: Townley—slow; Montevallo—moderate
Available water capacity: Townley—moderate or low; Montevallo—very low
Reaction: Townley—extremely acid to strongly acid, except where the soil has been limed;

Montevallo—very strongly acid to medium acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: Townley—20 to 40 inches; Montevallo—10 to 20 inches

Most areas of these soils are used as woodland. The soils are unsuited to row crops, small grain, and hay and are poorly suited to pasture. Good pasture management is essential to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

These soils are unsuited to most urban uses because of the slope and the depth to bedrock. The slowly permeable subsoil is an additional limitation in areas of the Townley soil. Because of the severity of these limitations, an alternative site generally should be selected.

These soils are poorly suited to woodland. The slope causes a severe erosion hazard during harvesting and reforestation and limits the safe operation of equipment and the types of equipment that can be used. Seedling mortality is a management concern because of droughtiness, which is more severe on south- and west-facing slopes than on north- and east-facing slopes. Windthrow is a hazard because of a limited rooting depth. The trees suitable for planting include loblolly pine and Virginia pine.

This map unit is in land capability subclass VIIe.

WaD—Wallen gravelly loam, 12 to 20 percent slopes

This soil is moderately deep, moderately steep, and somewhat excessively drained. It is on the upland ridges and side slopes of Log Mountain and the Poor Valley Knobs. Slopes are smooth and convex. Individual areas range from 50 to 100 acres in size.

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

Surface layer:
0 to 2 inches; brown gravelly loam

Subsoil:
2 to 9 inches; yellowish brown very channery silt loam
9 to 22 inches; yellowish brown very channery silt loam

Bedrock:
22 to 27 inches; weathered, interbedded shale and fine grained sandstone
27 inches; hard, fine grained sandstone

Included with this soil in mapping are small areas of Montevallo and Townley soils. Montevallo soils have shale bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soil and are underlain by shale bedrock. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Wallen soil—

Permeability: Moderately rapid
Available water capacity: Very low or low
Reaction: Very strongly acid to medium acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 20 to 40 inches

Nearly all areas of this soil are used as woodland. This soil is unsuited to row crops and small grain and is poorly suited to hay and pasture. If the soil is used for pasture, a good vegetative cover is needed to control erosion.

This soil is poorly suited to most urban uses because of the depth to bedrock and the slope. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This soil is moderately suited to woodland. The slope moderately limits the operation of equipment. Seedling mortality is a problem because of the low or very low available water capacity. Windthrow is a management concern because of a moderately deep root zone. The trees suitable for planting include shortleaf pine and Virginia pine.

This soil is in land capability subclass VIs.

WaE—Wallen gravelly loam, 20 to 35 percent slopes

This soil is moderately deep, steep, and somewhat excessively drained. It is on the upland ridges and side slopes of Log Mountain and the Poor Valley Knobs. Slopes are smooth and convex. Individual areas range from 50 to 300 acres in size.

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

Surface layer:
0 to 2 inches; brown gravelly loam

Subsoil:
2 to 9 inches; yellowish brown very channery silt loam

9 to 22 inches; yellowish brown very channery silt loam

Bedrock:

22 to 27 inches; weathered, interbedded shale and fine grained sandstone
27 inches; hard, fine grained sandstone

Included with this soil in mapping are small areas of Jefferson, Montevallo, and Townley soils. Jefferson soils are on foot slopes and in coves. They have more clay and fewer rock fragments in the subsoil than the Wallen soil and are more than 60 inches deep over bedrock. Montevallo soils have shale bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soil and are underlain by shale bedrock. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Wallen soil—

Permeability: Moderately rapid
Available water capacity: Very low or low
Reaction: Very strongly acid to medium acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 20 to 40 inches

Nearly all areas of this soil are used as woodland. This soil is unsuited to row crops, small grain, and hay and is poorly suited to pasture.

This soil is poorly suited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that an alternative site generally should be selected.

This soil is moderately suited to woodland. The slope limits the safe operation of equipment and the types of equipment that can be used. Seedling mortality is a problem because of the low or very low available water capacity. Windthrow is a management concern because of a moderately deep root zone. The trees suitable for planting include shortleaf pine and Virginia pine.

This soil is in land capability subclass VIIs.

WaF—Wallen gravelly loam, 35 to 70 percent slopes

This soil is moderately deep, very steep, and somewhat excessively drained. It is on the upland ridges and side slopes of Log Mountain and the Poor Valley Knobs. Slopes are smooth and convex. Individual areas range from 50 to 300 acres in size.

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

Surface layer:

0 to 2 inches; brown gravelly loam

Subsoil:

2 to 9 inches; yellowish brown very channery silt loam
9 to 22 inches; yellowish brown very channery silt loam

Bedrock:

22 to 27 inches; weathered, interbedded shale and fine grained sandstone
27 inches; hard, fine grained sandstone

Included with this soil in mapping are small areas of Jefferson, Montevallo, and Townley soils. Jefferson soils are on foot slopes and in coves. They have more clay and fewer rock fragments in the subsoil than the Wallen soil and are more than 60 inches deep over bedrock. Montevallo soils have shale bedrock at a depth of 10 to 20 inches. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soil and are underlain by shale bedrock. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Wallen soil—

Permeability: Moderately rapid
Available water capacity: Very low or low
Reaction: Very strongly acid to medium acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 20 to 40 inches

All areas of this soil are used as woodland. This soil is unsuited to row crops, small grain, hay, and pasture.

This soil is unsuited to most urban uses because of the slope and the depth to bedrock. These limitations are so severe that an alternative site should be selected.

This soil is poorly suited to woodland. The slope causes an erosion hazard during harvesting and reforestation and severely limits the safe operation of equipment and the types of equipment that can be used. Seedling mortality is a problem because of the low or very low available water capacity. Windthrow is a management concern because of a moderately deep root zone. The trees suitable for planting include shortleaf pine and Virginia pine.

This soil is in land capability subclass VIIs.

WrE—Wallen-Rock outcrop complex, 20 to 35 percent slopes

This map unit consists of a Wallen soil and sandstone outcrops on the ridgetops and side slopes of Clinch Mountain. The Wallen soil is moderately deep, steep, and somewhat excessively drained. The Wallen soil and the sandstone outcrops occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 50 to 200 acres in size.

The Wallen soil makes up about 60 percent of this map unit but ranges from 55 to 65 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Wallen soil are as follows—

Surface layer:

0 to 3 inches; dark yellowish brown gravelly fine sandy loam

Subsoil:

3 to 28 inches; strong brown very cobbly sandy loam

Bedrock:

28 inches; hard, coarse grained sandstone

Outcrops of sandstone bedrock make up about 20 percent of this map unit but range from 15 to 25 percent of each mapped area. The outcrops occur as individual rocks, ledges, or bluffs. Some scattered loose stones and boulders are throughout the unit.

Included in this unit in mapping are small areas of a soil that is made up largely of stones and boulders. This soil is in steep, narrow drainageways. Also included are small areas of Jefferson and Townley soils. Jefferson soils are in coves and on foot slopes. They have more clay and fewer rock fragments in the subsoil than the Wallen soil and are more than 60 inches deep over bedrock. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soil and are underlain by shale bedrock. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 20 percent of this map unit.

Important properties and features of the Wallen soil—

Permeability: Moderately rapid
Available water capacity: Very low or low
Reaction: Very strongly acid to medium acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 20 to 40 inches

Nearly all areas of this map unit are used as woodland. The unit is unsuited to row crops, small grain, and hay and is poorly suited to pasture. The rock outcrops cause a severe equipment limitation.

This map unit is unsuited to most urban uses because of the slope, the depth to bedrock, and the rock outcrops. These limitations are so severe that there is considerable expense in the design and construction of structures and facilities that function properly.

This map unit is moderately suited to woodland. The slope and the rock outcrops limit the safe operation of equipment. Seedling mortality and windthrow are management concerns because excessive drainage causes a moisture deficiency and shallow rooting. The trees suitable for planting include shortleaf pine and Virginia pine.

This map unit is in land capability subclass VIIs.

WrF—Wallen-Rock outcrop complex, 35 to 70 percent slopes

This map unit consists of a Wallen soil and sandstone outcrops on the side slopes of Clinch Mountain. The Wallen soil is moderately deep, very steep, and somewhat excessively drained. The Wallen soil and the sandstone outcrops occur as areas so intermingled that they could not be separated at the scale selected for mapping. Slopes are smooth and convex. Individual areas range from 100 to 600 acres in size.

The Wallen soil makes up about 60 percent of this map unit but ranges from 55 to 65 percent of each mapped area.

The typical sequence, depth, and composition of the layers in the Wallen soil are as follows—

Surface layer:

0 to 3 inches; dark yellowish brown gravelly fine sandy loam

Subsoil:

3 to 28 inches; strong brown very cobbly sandy loam

Bedrock:

28 inches; hard, coarse grained sandstone

Sandstone outcrops make up about 20 percent of this map unit but range from 15 to 25 percent of each mapped area. The outcrops occur as individual rocks, ledges, or bluffs. Some scattered loose stones and boulders are throughout the unit.

Included in this unit in mapping are small areas of a soil that is made up largely of stones and boulders. This soil is in steep, narrow drainageways. Also included are small areas of Jefferson and Townley soils. Jefferson soils are in coves and on foot slopes. They have more clay and fewer rock fragments in the subsoil than the Wallen soil and are more than 60 inches deep over bedrock. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soil and are underlain by shale bedrock. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping. Inclusions make up about 20 percent of this map unit.

Important properties and features of the Wallen soil—

Permeability: Moderately rapid
Available water capacity: Very low or low
Reaction: Very strongly acid to medium acid
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: 20 to 40 inches

Nearly all areas of this map unit are used as woodland. The unit is unsuited to row crops, small grain, and hay and is poorly suited to pasture. The rock outcrops and the slope are severe limitations.

This map unit is unsuited to most urban uses because of the slope, the depth to bedrock, and the rock outcrops. Another site should be selected.

This map unit is poorly suited to woodland. The slope causes an erosion hazard during harvesting and reforestation. The rock outcrops and the slope severely limit the safe operation of equipment and the types of equipment that can be used. Seedling mortality and windthrow are management concerns because excessive drainage causes a moisture deficiency and shallow rooting. The trees suitable for planting include shortleaf pine and Virginia pine.

This map unit is in land capability subclass VIIs.

WyC2—Waynesboro loam, 5 to 12 percent slopes, eroded

This soil is very deep, sloping, and well drained. It is on the narrow tops and upper side slopes of high stream terraces along the Holston River and on isolated terraces in the Richland Valley. Slopes are smooth and convex. Individual areas range from 5 to 50 acres in size.

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

Surface layer:
0 to 6 inches; brown loam

Subsoil:
6 to 16 inches; red clay loam
16 to 34 inches; red sandy clay
34 to 60 inches; red clay

Included with this soil in mapping are small areas of Etowah and Shady soils. Etowah soils are in concave areas on uplands and foot slopes. They have less clay in the subsoil than the Waynesboro soil. Shady soils are on low stream terraces. They have less clay and more sand in the subsoil than the Waynesboro soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Waynesboro soil—

Permeability: Moderate
Available water capacity: High
Reaction: Strongly acid or very strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay, pasture, or crop production. This soil is moderately suited to row crops and small grain and is well suited to hay and pasture. Erosion is a moderate hazard when cultivated crops are grown. A combination of conservation practices is needed to control runoff and erosion, conserve moisture, and maintain tilth.

This soil is moderately suited to most urban uses. The limiting soil features are the slope and the clayey subsoil. Properly designing structures and facilities can minimize the influence of the limiting features.

This soil is well suited to woodland. Plant competition is the only significant management concern. Seeds and seedlings grow well if competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, loblolly pine, and shortleaf pine.

This soil is in land capability subclass IIIe.

WyD2—Waynesboro loam, 12 to 20 percent slopes, eroded

This soil is very deep, moderately steep, and well drained. It is on the side slopes of high stream terrace ridges along the Holston River and on isolated terraces in the Richland Valley. Slopes are smooth and convex. Individual areas range from 5 to 50 acres in size.

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

Surface layer:
0 to 6 inches; brown loam

Subsoil:
6 to 16 inches; red clay loam
16 to 34 inches; red sandy clay
34 to 60 inches; red clay

Included with this soil in mapping are small areas of Etowah and Shady soils. Etowah soils are on concave hillsides and foot slopes. They have less clay in the subsoil than the Waynesboro soil. Shady soils are on low stream terraces. They have less clay and more sand in the subsoil than the Waynesboro soil. Individual areas of the included soils are less than 5 acres in size and could not be separated at the scale selected for mapping.

Important properties and features of the Waynesboro soil—

Permeability: Moderate
Available water capacity: High
Reaction: Strongly acid or very strongly acid, except where the soil has been limed
Flooding: None
Depth to a seasonal high water table: More than 6 feet
Depth to bedrock: More than 60 inches

Most areas of this soil have been cleared and are used for hay or pasture. This soil is poorly suited to row crops and small grain and is moderately suited to hay and pasture. Erosion is a severe hazard when cultivated crops are grown. Good pasture management is needed to control erosion and maintain productivity. Good management includes applications of fertilizer, weed control, and prevention of overgrazing.

This soil is poorly suited to most urban uses because of the slope and the clayey subsoil. These limitations generally can be overcome. For some uses, however, overcoming the limitations may be too costly.

This soil is moderately suited to woodland. The slope causes a moderate erosion hazard and limits the safe operation of equipment. Plant competition is a management concern unless competing vegetation is controlled. The trees suitable for planting include yellow-poplar, black walnut, loblolly pine, and shortleaf pine.

This soil is in land capability subclass IVe.

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the 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 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

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

The soils identified as prime farmland in the county are:

DeB2	Dewey silt loam, 2 to 5 percent slopes, eroded
Ek	Elk silt loam
EtB	Etowah silt loam, 2 to 5 percent slopes
Ha	Hamblen silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Se	Sewanee loam, occasionally flooded
ShB	Shady loam, 1 to 4 percent slopes

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

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 prime farmland is described.

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.

Grainger County had about 72,000 acres of cleared land in 1989, according to Resource Bulletin SO-148 of the U.S. Forest Service. This acreage is about 41 percent of the land area in the county. In 1987, the county had 53,069 acres of cropland, according to the Census of Agriculture. Of this acreage, 16,886 acres was used for harvested crops and 36,183 acres was pasture. There are some other areas of permanent pasture that are not used for crops.

The most common grasses and legumes in pasture mixtures are tall fescue, orchardgrass, ladino clover, and Korean lespedeza. Tall fescue and clover are the dominant hay species. The largest acreages of row crops are used for corn, tobacco, tomatoes, or soybeans. Small grain and alfalfa are planted for hay, silage, or grain.

Most of the soils in the valleys of the county are suited to pasture. Legumes should be seeded with fescue or orchardgrass when pastures are established. Pure grass pastures should be renovated with additions of legumes. Legumes improve the pastures and increase forage production by taking nitrogen from the air. Information about pasture seeding and renovation can be obtained from local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

Dewey, Elk, Etowah, Shady, and Waynesboro soils are used dominantly for crops and pasture. Also, significant acreages of Fullerton, Hamblen, and Townley soils used for hay or pasture. Erosion-control measures, such as contour farming, contour stripcropping, cover crops, no-till cropping, crop residue management, and a conservation cropping sequence, are needed.

Livestock farms have a significant acreage of pasture and hay crops. Including forage crops in the cropping sequence reduces the hazard of erosion on sloping land, adds nitrogen, and improves tilth for the following crop. Erosion-control measures increase the rate of water infiltration, conserve moisture, and help to control surface runoff and erosion. They help to maintain the productivity of the soil by reducing the loss of topsoil. These measures also improve water quality by decreasing the amount of sediment and nutrients entering streams and lakes. Information about the design of erosion-control measures and assistance in planning conservation practices are available in the local office of the Natural Resources Conservation Service.

Additions of lime and fertilizer should be based on the results of a soil test, the needs of the crop, and the expected yield level. The soil testing laboratory of the Cooperative Extension Service can help in determining the kinds and amounts of lime and fertilizer to be applied.

The soils best suited to crops are commonly the ones that are best suited to other uses, including urban development. There are some exceptions because some soil properties are more limiting for one use than for another; therefore, the soil survey should be consulted when land use priorities are determined. For example, a soil that is subject to flooding may be very productive for some crops but be unsuited to residential development.

Yields per Acre

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

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

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

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small or reliable yield data are not available. 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 (USDA, 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for 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.

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 as commercial cropland, pasture, or woodland.

There are no class V or class VIII soils identified in Grainger County.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry. Capability subclass *c* is not identified in Grainger County.

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

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

Woodland Management and Productivity

Grainger County originally was completely forested. Currently, about 59 percent of the land area is forested. Almost all areas on and around Clinch Mountain, except for small tracts in Poor Valley, remain forested, primarily with upland oaks, yellow-poplar, Virginia pine, white pine, and various minor species. Scattered smaller areas of woodland are throughout the county, including rough areas that are largely unsuited to agricultural uses.

The oak-hickory-pine forest type makes up most of the forested areas. Poplar, beech, and eastern hemlock grow in the deeper gorges and moist coves of steep mountainsides. Sycamore, maple, and sweetgum are common throughout the county.

Wood products make a valuable contribution to the county’s economy, but forest production is well below its potential in the county. The forests provide recreational opportunities, wildlife habitat, natural beauty, erosion control, and watershed protection.

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 suitablity for forest land, the limitations affecting managment of forest land, and the tree species suitable for planting. Table 6 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

Grainger County has numerous recreational facilities, some of which are privately owned. Many of the recreational activities in the county are water based. The Tennessee Valley Authority provides public picnic areas and boat-launching ramps on Cherokee and Norris Lakes. The county has several community parks, one golf course and country club, and a swimming pool.

The soils of the survey area are rated in table 7 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 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

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, prepared this section.

There is a wide variety of wildlife species indigenous to Grainger County. Several species, such as whitetail deer and eastern wild turkey, are increasing in number as a result of stocking programs by the Tennessee Wildlife Resources Agency (TWRA) and improved management of wildlife habitat. The basic types of wildlife habitat and their extent in the county have remained fairly stable over the past several years. About 59 percent of the county is wooded, and 41 percent is openland principally managed for grass production. The largest areas of cropland are in the valley of the Holston River.

Whitetail deer is the most popular big game species in the county. In the middle of the 1940's, there were nearly no deer in the county. Since then, deer numbers have increased dramatically. In 1982, the county supported a population of approximately one deer per 40 acres, according to the TWRA. Another game animal is eastern wild turkey. In the 1950's, the county had no turkeys. There is now a good population in the northern half of the county, from Rutledge to the Clinch River. The series of wooded ridges of northern red oak and white oak and open grassy valleys provide good acorn mast and nesting and brooding habitat.

Several small game species are in the county. Bobwhite quail inhabit the county, but the population of this bird is low because of poor habitat. The population of cottontail rabbits also is low. Areas in the southern part of the county where agriculture is diversified have fair numbers of these rabbits. Mourning doves inhabit areas where grain crops are grown. There are four squirrel species in the county. Gray squirrels, fox squirrels, and southern flying squirrels are throughout the county, and northern flying squirrels are at the higher elevations. The overall squirrel population is medium to high.

Ruffed grouse is becoming the most popular upland game bird in the county. It is native to the Appalachian Mountains. The population of this bird is high on Clinch Mountain and in the Dutch Valley area and medium to low in the southern part of the county.

Wintering waterfowl that migrate through the county are low in number. Cherokee Lake, on the southern boundary of the county, Norris Lake, on the northern boundary, and numerous small ponds provide some habitat. The most common species are wood ducks, mallards, teal, bufflehead, and ringneck.

The population of wetland furbearers in the county is low because of the small amount of suitable habitat. The county has some minks and muskrats. Upland furbearers include coyotes, raccoons, red foxes, gray foxes, bobcats, opossum, striped skunks, spotted skunks, and weasels. The population of upland furbearers appears to be high.

Many nongame wildlife species, including birds, mammals, amphibians, reptiles, and fish, inhabit the county. The most common of these animals are red-tailed hawks, barred owls, many species of songbirds, small rodents, box turtles, bullfrogs, rat snakes, creek chubs, and darters.

Grainger County has 148 miles of warm-water streams, which provide approximately 1,080 acres of aquatic habitat. Some of the more common fish species in these streams are largemouth bass, rock bass, bluegill sunfish, channel catfish, flathead catfish, and several species of redhorse suckers and minnows.

Many private ponds are in the county, but most are small. The most popular species stocked in these ponds are largemouth bass, bluegill sunfish, and channel catfish. Most of the soils in the county are moderately or severely limited as sites for ponds because of seepage or excessive slope. Large areas are underlain by limestone and have numerous sinkholes and subsurface drainageways. Therefore, the potential for warm-water aquaculture in earthen ponds is low. The most promising kind of aquaculture in the county is cold-water trout production. The Ridge and Valley aquifer varies greatly in depth and yield, but good water is generally available between depths of 100 and 300 feet and wells may yield 5 to 2,000 gallons per minute. Portions of Buffalo Creek and Puncheon Camp Creek are suitable for supporting rainbow trout throughout the year. Buffalo Creek is periodically stocked with trout.

Two large public reservoirs, Cherokee and Norris Lakes, provide excellent opportunities for fishing. The fish in these lakes include many of the warm-water species in the ponds and streams and also include striped bass, striped-white bass hybrids, crappie, walleye, and sauger. Norris Lake is recognized as a “second-story” reservoir because it has a cold, well oxygenated “under-story” suitable for trout.

The county has very few wetlands. Most of the wetlands are in areas of the poorly drained, frequently flooded Bloomingdale soils. Wetlands are recognized as some of the most productive wildlife areas in the county.

Conservation practices can improve wildlife habitat. In areas of cropland, planned crop rotations and crop residue management can provide food and needed winter cover for many species of wildlife. Deferred livestock grazing and fences 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 many wildlife species. Selective thinning of woodland, while protecting den and quality mast-producing trees, can improve wildlife habitat.

Some practices are harmful to wildlife. The most common harmful practices are killing of weeds and insects by indiscriminate burning and applications of chemicals, heavy grazing, clean mowing during the nesting season, clean fall plowing, extensive clear cutting in timbered areas, draining wetlands, and removing den and mast-producing trees.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and 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 goldenrod, beggarweed, 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, poplar, ash, sweetgum, dogwood, hickory, blackberry, and black walnut. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are shrub lespedeza, 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 cedar.

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, wildrye, rushes, sedges, and reeds.

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

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. 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, ruffed grouse, 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, 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 9 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, or 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 classifications 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 10 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 11 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 12 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, and susceptibility to flooding. 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 or to a cemented pan 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, low fertility, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

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

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help 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 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

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

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

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

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 ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

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*, greater 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 15 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. "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

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1999). 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 16 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve 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 Bradyville 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” (USDA, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA, 1999). 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 associated with each soil series are described in the section “Detailed Soil Map Units.”

Bellamy Series

The Bellamy series consists of very deep, moderately well drained, sloping soils on low terraces and foot slopes. These soils formed in colluvium and alluvium weathered from shale and limestone. Slopes range from 5 to 12 percent.

Bellamy soils are geographically associated with Montevallo and Townley soils, which are on shale uplands. Montevallo soils have shale bedrock at a depth of 10 to 20 inches. Townley soils have more clay in the subsoil than the Bellamy soils and have shale bedrock at a depth of 20 to 40 inches.

Typical pedon of Bellamy loam, 5 to 12 percent slopes, 1/4 mile west of the intersection of Williams Road on Tater Valley Road; 300 feet north of road in a field:

Ap—0 to 7 inches; brown (10YR 4/3) loam; few fine faint dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; friable; many fine and medium roots; mildly alkaline; abrupt smooth boundary.

BA—7 to 13 inches; dark yellowish brown (10YR 4/4) loam; common medium faint brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; medium acid; abrupt smooth boundary.

Bt—13 to 24 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; 2 percent pebbles; very strongly acid; clear smooth boundary.

Btx1—24 to 30 inches; yellowish brown (10YR 5/4) clay loam; many medium distinct light brownish gray (10YR 6/2) and common medium prominent red (2.5YR 5/8) mottles; weak medium platy structure; firm; few very fine roots; few faint clay films on faces of peds; 5 percent pebbles; brittleness in about half the volume; very strongly acid; clear smooth boundary.

Btx2—30 to 42 inches; yellowish brown (10YR 5/4) clay loam; many coarse distinct light brownish gray (10YR 6/2) and common medium distinct strong brown (7.5YR 5/8) mottles; weak medium platy structure; firm; 5 percent pebbles; brittleness in about half the volume; very strongly acid; clear smooth boundary.

Btx3—42 to 60 inches; strong brown (7.5YR 5/6) clay loam; many medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 6/8) mottles; moderate medium subangular blocky structure; firm; 5 percent pebbles; brittleness in one-third to half the volume; strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is medium acid to very strongly acid, but surface layer is less acid where the soils have been limed. The content of rock fragments ranges from 0 to 5 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The texture is loam.

Many pedons have a transitional horizon between the Ap and Bt horizons.

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 gray within a depth of 30 inches. The texture is clay loam or loam.

The Btx horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of gray, brown, or red. The texture is clay loam or loam. Some pedons have evidence of a discontinuity at the contact between the Bt and Btx horizons.

Bloomingdale Series

The Bloomingdale series consists of very deep, poorly drained, nearly level soils on low-lying flood plains. These soils formed in mixed alluvium derived from uplands consisting of limestone, shale, and sandstone. Slopes range from 0 to 2 percent.

Bloomingdale soils are geographically associated with Bradyville, Dewey, and Hamblen soils. Bradyville and Dewey soils are on uplands. They are clayey and are well drained. Hamblen soils are on flood plains. They are moderately well drained and have less clay in the subsoil than the Bloomingdale soils.

Typical pedon of Bloomingdale silty clay loam, frequently flooded; on Lea Springs Road, 0.8 mile from its junction with Highway 11W; 200 feet west of road in a field:

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine faint light olive brown (2.5Y 5/6) mottles; weak medium granular structure; friable; common fine and medium roots; slightly acid; abrupt smooth boundary.

Bg1—5 to 12 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine distinct light gray (N 7/0) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; common fine pores; many fine black and brown concretions; medium acid; abrupt smooth boundary.

Bg2—12 to 20 inches; light brownish gray (2.5Y 6/2) silty clay; many fine faint light gray (N 7/0) mottles; weak medium subangular blocky structure; firm; few very fine pores; many fine black and brown concretions; medium acid; clear smooth boundary.

Cg1—20 to 37 inches; light brownish gray (2.5Y 6/2) clay; many coarse faint light olive brown (2.5Y 5/6) mottles; massive; firm; many fine black concretions; medium acid; gradual smooth boundary.

Cg2—37 to 60 inches; light gray (2.5Y 7/2) silty clay;

many coarse distinct brownish yellow (10YR 6/8) and light olive brown (2.5Y 5/6) mottles; massive; firm; 5 percent small rounded pebbles and shale fragments; medium acid.

The thickness of the solum ranges from 14 to 30 inches. The depth to bedrock is more than 60 inches. Reaction ranges from medium acid to neutral. The content of rock fragments ranges from 0 to 5 percent within a depth of 40 inches and is as much as 20 percent below that depth.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The texture is silty clay loam.

The Bg horizon has hue of 7.5YR to 2.5Y. It has value of 5 and chroma of 1 or value of 6 and chroma of 1 or 2. The texture is silty clay loam or silty clay.

The Cg horizon has hue of 7.5YR to 5Y and has value of 5 and chroma of 1 or value of 6 or 7 and chroma of 1 or 2, or it is neutral in hue. The texture is silty clay, silty clay loam, or clay.

Bradyville Series

The Bradyville series consists of deep, well drained, sloping to steep soils on uplands. These soils formed in limestone residuum. Slopes range from 5 to 30 percent.

Bradyville soils are geographically associated with Opequon, Talbott, and Townley soils. Opequon soils are on limestone uplands. They have limestone bedrock at a depth of 10 to 20 inches. Talbott soils are in landscape positions similar to those of the Bradyville soils. They have limestone bedrock at a depth of 20 to 40 inches. Townley soils are on shale uplands. They have shale bedrock at a depth of 20 to 40 inches.

Typical pedon of Bradyville silt loam, in an area of Talbott-Rock outcrop-Bradyville complex, 5 to 20 percent slopes, eroded; from Highway 11W, $^{1}/_{2}$ mile south on Fennel Road; 125 feet west of road in a woods:

A—0 to 3 inches; dark yellowish brown (10YR 3/4) silt loam; many fine distinct dark brown (7.5YR 4/4) mottles; weak medium granular structure; friable; many fine and medium roots; few fine pores; 3 percent angular fragments of chert; mildly alkaline; abrupt wavy boundary.

Bt1—3 to 8 inches; yellowish red (5YR 4/6) silty clay; many medium prominent brown (10YR 4/3) mottles; moderate fine subangular blocky structure; friable; common fine and medium roots; common fine pores; few fine black concretions and stains; medium acid; clear wavy boundary.

Bt2—8 to 32 inches; yellowish red (5YR 4/6) silty clay; moderate medium subangular blocky structure; firm; common fine roots; few fine and medium pores; common distinct clay films on faces of peds; few fine black concretions and stains; medium acid; clear smooth boundary.

Bt3—32 to 39 inches; yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; many distinct clay films on faces of peds; few fine black concretions and stains; medium acid; clear smooth boundary.

BC—39 to 51 inches; yellowish red (5YR 4/8) clay; common medium distinct red (2.5YR 4/8) and common fine and medium prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine black concretions and stains; neutral; abrupt wavy boundary.

R—51 inches; limestone bedrock.

The thickness of the solum and the depth to bedrock range from 40 to 60 inches. Reaction generally is strongly acid or medium acid, but it ranges to mildly alkaline in the horizon directly above bedrock and in the surface layer where the soils have been limed. The content of chert fragments or limestone gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 4. The texture generally is silt loam but includes silty clay loam where the soils are eroded.

Some pedons have a transitional horizon between the A and Bt horizons.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 6 or 8. It commonly has mottles in shades of brown, yellow, or red. The texture is silty clay or clay.

Some pedons have a C horizon or a transitional horizon between the Bt horizon and the underlying bedrock.

Dewey Series

The Dewey series consists of very deep, well drained, gently sloping to steep soils on uplands. These soils formed in limestone residuum. Slopes range from 2 to 35 percent.

Dewey soils are geographically associated with Etowah and Minvale soils. Etowah soils are in concave areas and on benches and foot slopes. They have less clay in the subsoil than the Dewey soils. Minvale soils are in the lower colluvial areas. They have less clay and a higher content of chert fragments in the subsoil than the Dewey soils.

Typical pedon of Dewey silt loam, in an area of Dewey-Etowah complex, 12 to 20 percent slopes; from Highway 92 south, left on Phillips Springs Road and $^{4}/_{10}$ mile down Phillips Springs Road; directly south of the road:

Ap—0 to 4 inches; brown (7.5YR 4/4) silt loam; weak fine and medium granular structure; friable; many fine and common medium roots; few fine pores; 3 percent fragments of chert as much as $^{1}/_{4}$ inch in diameter; many very fine black stains; slightly acid; clear smooth boundary.

Bt1—4 to 8 inches; yellowish red (5YR 5/6) silty clay loam; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; many fine and common medium roots; few fine pores; few distinct clay films on faces of peds; 5 percent fragments of chert as much as $^{1}/_{2}$ inch in diameter; many fine black stains and concretions; strongly acid; clear smooth boundary.

Bt2—8 to 24 inches; red (2.5YR 4/8) silty clay; many fine faint red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; few fine pores; many distinct clay films on faces of peds; many fine stains and concretions; very strongly acid; gradual smooth boundary.

Bt3—24 to 48 inches; red (2.5YR 4/8) clay; few medium prominent yellowish brown (10YR 5/6) and few medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine, medium, and coarse roots; few fine tubular pores; many distinct clay films on faces of peds and in some of the larger pores; many fine black stains and concretions; very strongly acid; gradual smooth boundary.

Bt4—48 to 62 inches; red (2.5YR 4/8) clay; many fine prominent yellowish brown (10YR 5/8) and many fine faint red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; many distinct clay films on faces of peds and in some of the larger pores; 5 percent fragments of chert as much as $^{1}/_{2}$ inch in diameter; very strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid where the soils have been limed. The content of chert fragments ranges from 0 to 15 percent throughout the profile.

In most areas the Ap horizon has hue of 7.5YR and value and chroma of 3 or 4 and is silt loam. In some small severely eroded areas, however, it has hue of 5YR and is silty clay loam.

A few pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. It commonly has mottles in shades of brown, red, or yellow. The mottles commonly increase in number and size with increasing depth. The texture generally is silty clay or clay, but in some pedons it is silty clay loam in the upper few inches of the horizon.

Elk Series

The Elk series consists of very deep, well drained, nearly level soils on low stream terraces. These soils formed in mixed alluvium. Slopes range from 0 to 3 percent.

Elk soils are geographically associated with Shady and Waynesboro soils. Shady soils are in the slightly higher areas on terraces. They have more sand in the subsoil than the Elk soils and are more acid throughout. Waynesboro soils are on high stream terraces. They have more clay and less silt in the subsoil than the Elk soils and are more acid throughout.

Typical pedon of Elk silt loam, 250 feet northwest of Nance Ferry:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; very friable; common fine and medium roots; slightly acid; clear smooth boundary.

BA—8 to 17 inches; dark yellowish brown (10YR 4/4) silt loam; common medium faint yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; very friable; common fine and medium roots; common medium pores; slightly acid; clear smooth boundary.

Bt1—17 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular structure; very friable; common fine roots; common fine and medium pores; medium acid; gradual smooth boundary.

Bt2—28 to 42 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common fine roots; common fine and medium pores; few faint clay films on faces of some peds; medium acid; gradual smooth boundary.

C—42 to 60 inches; dark yellowish brown (10YR 4/4) silty clay loam that has pockets and lenses of loam and fine sandy loam; common medium distinct pale brown (10YR 6/3) mottles; massive; friable; few very fine roots; few fine pores; few fine black concretions; medium acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. Reaction is slightly acid to strongly acid throughout the profile. The content of rock fragments is less than 5 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4. The texture is silt loam.

Many pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The texture is silty clay loam or silt loam.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 4. The texture generally is silt loam or silty clay loam, but in some pedons this horizon is stratified with thin layers or lenses of loam or fine sandy loam.

Etowah Series

The Etowah series consists of very deep, well drained, gently sloping to steep soils in concave areas on uplands and on benches and foot slopes. These soils formed in colluvium and residuum derived from limestone. Slopes range from 2 to 35 percent.

Etowah soils are geographically associated with Dewey and Minvale soils. Dewey soils are on limestone uplands. They have more clay in the subsoil than the Etowah soils. Minvale soils are in the lower colluvial areas. They have more fragments of chert throughout than the Etowah soils.

Typical pedon of Etowah silt loam, in an area of Dewey-Etowah complex, 12 to 20 percent slopes; from Highway 92 south, left on Phillips Springs Road and 3/10 mile down Phillips Springs Road; directly south of the road:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable; many very fine and fine roots; many fine pores; 3 percent fragments of chert; many fine black concretions; slightly acid; gradual wavy boundary.

BA—10 to 20 inches; brown (7.5YR 4/4) silt loam; common medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common very fine and fine roots; many fine pores; 5 percent fragments of chert; many fine black concretions; slightly acid; clear wavy boundary.

Bt1—20 to 42 inches; yellowish red (5YR 5/8) silty clay loam; many fine prominent brown (10YR 4/3) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; common very fine and fine roots; common medium pores; common distinct clay films on faces of peds; 5 percent fragments of chert; common fine black concretions; strongly acid; gradual wavy boundary.

2Bt2—42 to 50 inches; red (2.5YR 4/8) silty clay; common fine distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine and fine roots; few fine pores; many distinct clay films on faces of peds and in pores; 5 percent fragments of chert; common fine black concretions; strongly acid; gradual wavy boundary.

2Bt3—50 to 62 inches; red (2.5YR 4/8) silty clay; common medium prominent yellowish brown (10YR 6/8) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few fine pores; many distinct clay films on faces of peds and in pores; strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is very strongly acid or strongly acid, but the upper part of the pedon is less acid where the soils have been limed. The content of chert fragments ranges from 0 to 15 percent throughout the profile. Many pedons have a lithologic discontinuity below a depth of 40 inches.

The Ap horizon has hue of 7.5YR or 10YR and value and chroma of 3 or 4. The texture is silt loam.

Many pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 6 or 8. It commonly has mottles in shades of red, brown, or yellow. The texture is clay loam or silty clay loam.

The 2Bt horizon has colors like those of the Bt horizon. The texture is silty clay or clay.

Fullerton Series

The Fullerton series consists of very deep, well drained, sloping to steep soils on uplands. These soils formed in cherty limestone residuum. Slopes range from 5 to 35 percent.

Fullerton soils are geographically associated with Dewey, Etowah, and Minvale soils. Dewey soils are in landscape positions similar to those of the Fullerton soils. They have fewer rock fragments in the subsoil than the Fullerton soils. Etowah soils are in concave areas. They have less clay and fewer rock fragments in the subsoil than the Fullerton soils. Minvale soils are in coves and on foot slopes. They have less clay in the subsoil than the Fullerton soils.

Typical pedon of Fullerton gravelly loam, 20 to 35 percent slopes, eroded, 2 miles west of Elm Springs Church:

Ap—0 to 5 inches; brown (10YR 4/3) gravelly loam; moderate fine granular structure; very friable; common fine and medium roots; 15 percent chert gravel; medium acid; abrupt smooth boundary.

Bt1—5 to 15 inches; red (2.5YR 4/8) gravelly clay; moderate fine subangular blocky structure; friable; common fine roots; common fine pores; 20 percent chert gravel; many distinct clay films on faces of peds and in pores; strongly acid; gradual smooth boundary.

Bt2—15 to 46 inches; red (2.5YR 4/6) gravelly clay; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine and medium pores; common distinct clay films on faces of peds and in pores; 20 percent chert gravel; very strongly acid; gradual smooth boundary.

Bt3—46 to 60 inches; red (2.5YR 4/6) gravelly clay; common medium distinct yellowish red (5YR 5/8) mottles; strong medium subangular blocky structure; firm; common fine pores; common distinct clay films on faces of peds and in pores; 20 percent chert gravel; very strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is very strongly acid or strongly acid, but the surface layer is less acid where the soils have been limed. The content of gravel, mainly chert, ranges from 15 to 35 percent throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine earth is loam. Some pedons have a thin A horizon with value of 3.

Some pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine earth generally is silty clay or clay, but in some pedons it is silty clay loam in the upper few inches of the horizon.

Hamblen Series

The Hamblen series consists of very deep, moderately well drained, nearly level soils on flood plains. These soils formed in mixed, loamy alluvium. Slopes range from 0 to 2 percent.

Hamblen soils are geographically associated with Bloomingdale, Bradyville, and Dewey soils. Bloomingdale soils are in the lower areas on flood plains and are poorly drained. Bradyville soils are on uplands. They are clayey, are well drained, and have limestone bedrock at a depth of 40 to 60 inches. Dewey soils are on uplands. They are clayey and are well drained.

Typical pedon of Hamblen silt loam, frequently flooded, from Rutledge High School, 1/4 mile south; on a flood plain near Richland Creek:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; common fine faint dark yellowish brown mottles; moderate medium granular structure; friable; common fine and medium and few coarse roots; few fine pores; slightly acid; clear smooth boundary.

Bw1—8 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint brown mottles; weak medium subangular blocky structure parting to moderate fine granular; friable; common fine and medium roots; common fine and medium pores; few fine reddish and black concretions; common dark grayish brown (10YR 4/2) wormcasts; medium acid; clear smooth boundary.

Bw2—17 to 39 inches; yellowish brown (10YR 5/4) loam; common medium distinct grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; common fine and medium pores; 5 percent shale fragments as much as 1/2 inch across; few medium and coarse red and black concretions and bits of charcoal; medium acid; clear smooth boundary.

Bw3—39 to 55 inches; brown (10YR 5/3) loam; many medium distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; few medium and coarse roots; few fine and medium pores; medium acid; abrupt smooth boundary.

Cg—55 to 60 inches; dark gray (N 4/0) loam; massive; very friable; neutral.

The thickness of the solum ranges from 25 to 55 inches. The depth to bedrock is more than 60 inches. Reaction ranges from neutral to strongly acid throughout the profile. The content of rock fragments ranges from 0 to 15 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4. The texture is silt loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It has mottles in shades of gray within a depth of 24 inches. The texture is loam, silt loam, silty clay loam, or clay loam.

The C horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 4 or 5 and chroma of 0 to 6. In some pedons it is profusely mottled in shades of brown, yellow, or gray. The texture is loam, fine sandy loam, silty clay loam, or clay loam.

Jefferson Series

The Jefferson series consists of very deep, well drained, sloping to steep soils on foot slopes, benches, and toe slopes and in coves. These soils formed in loamy colluvium derived from sandstone and shale. Slopes range from 5 to 35 percent.

Jefferson soils are geographically associated with Sewanee and Wallen soils. Sewanee soils are on flood plains. They have less clay in the subsoil than the Jefferson soils and are moderately well drained. Wallen soils are on uplands. They have more rock fragments in the subsoil than the Jefferson soils and have bedrock at a depth of 20 to 40 inches.

Typical pedon of Jefferson loam, 12 to 20 percent slopes, 3 miles east of Noah's Chapel Church on Poor Valley Road; directly south of road in a woods:

Oe—1 inch to 0; partially decomposed layer of leaves and twigs in a mat of fine roots.

A—0 to 6 inches; brown (10YR 4/3) loam; common fine faint brown (10YR 5/3) mottles; weak fine granular structure; very friable; many fine, medium, and coarse roots; 7 percent fragments of sandstone; medium acid; clear smooth boundary.

BE—6 to 16 inches; light yellowish brown (10YR 6/4) silt loam; few medium faint yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; very friable; common fine and medium and few coarse roots; few fine pores; 10 percent fragments of sandstone; few very fine black concretions; strongly acid; abrupt wavy boundary.

Bt1—16 to 33 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; common fine and medium pores; few distinct clay films on faces of peds; 5 percent fragments of sandstone; few fine black concretions; very strongly acid; gradual smooth boundary.

Bt2—33 to 51 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct strong brown (7.5YR 5/6) and very pale brown (10YR 7/4) mottles; weak medium subangular blocky structure; friable; few medium and coarse roots; common fine pores; common distinct clay films on faces of peds and in the larger pores; 7 percent fragments of sandstone; few fine black concretions; very strongly acid; gradual smooth boundary.

BC—51 to 60 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 6/8), yellowish red (5YR 5/6), and very pale brown (10YR 7/4) clay loam; weak fine subangular blocky structure; friable; common fine pores; 10 percent fragments of sandstone; few fine black concretions; very strongly acid.

The solum is more than 40 inches thick. The depth to bedrock is more than 60 inches. Reaction generally is very strongly acid or strongly acid, but it ranges to neutral in the A horizon. The content of sandstone and shale fragments ranges from 0 to 15 percent throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The texture is loam.

Many pedons have a transitional horizon between the A and Bt horizons.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. Mottles in shades of brown, yellow, or red are commonly throughout the horizon, and gray mottles are in the lower part of the horizon in some pedons. The texture is loam, clay loam, or sandy clay loam.

The BC horizon is mottled in shades of brown, red, yellow, or gray. The texture is loam, clay loam, or sandy clay loam.

Minvale Series

The Minvale series consists of very deep, well drained, moderately steep and steep soils in coves and on foot slopes and benches. These soils formed in colluvium derived from cherty limestone. Slopes range from 12 to 35 percent.

Minvale soils are geographically associated with Dewey, Etowah, and Fullerton soils. Dewey soils are on limestone uplands. They have more clay and fewer rock fragments in the subsoil than the Minvale soils. Etowah soils are in concave areas. They have fewer rock fragments in the subsoil than the Minvale soils. Fullerton soils are on uplands. They have more clay in the subsoil than the Minvale soils.

Typical pedon of Minvale loam, 12 to 20 percent slopes, 1.5 miles southwest of Arnwine Cemetery:

A—0 to 5 inches; brown (10YR 5/3) loam; moderate medium granular structure; very friable; many fine and medium roots; 10 percent chert gravel; slightly acid; abrupt wavy boundary.

E—5 to 8 inches; light yellowish brown (10YR 6/4) gravelly loam; weak fine subangular blocky structure parting to weak fine granular; very friable; common fine, medium, and coarse roots; common very fine pores; 17 percent chert gravel; medium acid; clear smooth boundary.

BE—8 to 14 inches; yellowish brown (10YR 5/4) gravelly loam; common fine faint light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; very friable; many fine and medium and few coarse roots; common fine pores; 17 percent chert gravel; common fine black concretions; very strongly acid; clear wavy boundary.

Bt1—14 to 36 inches; yellowish brown (10YR 5/8) gravelly silty clay loam; many medium faint yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; few fine and medium roots; common fine and medium pores; few distinct clay films on faces of peds and in pores; 25 percent chert gravel; few fine black concretions; very strongly acid; clear smooth boundary.

Bt2—36 to 60 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common medium faint strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; friable; few fine roots; common fine and medium pores; common distinct clay films on faces of peds and in pores; 25 percent chert gravel; few very fine black concretions; very strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is very strongly acid or strongly acid, but the surface layer is less acid where the soils have been limed. The content of rock fragments, mainly chert gravel, ranges from 10 to 20 percent in the A horizon and from 15 to 35 percent below the A horizon.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. The texture of the fine earth is loam.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The texture of the fine earth is loam or silt loam.

Some pedons have a transitional horizon between the A or E horizon and the Bt horizon.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine earth is silt loam or silty clay loam to a depth of 3 feet. It includes silty clay and clay below a depth of 3 feet.

Montevallo Series

The Montevallo series consists of shallow, well drained, sloping to very steep soils on uplands. These soils formed in shale residuum. Slopes range from 5 to 60 percent.

Montevallo soils are geographically associated with Opequon, Talbott, and Townley soils. Opequon and Talbott soils are on limestone uplands. Opequon soils have limestone bedrock at a depth of 10 to 20 inches, and Talbott soils have limestone bedrock at a depth of 20 to 40 inches. Townley soils are on shale uplands. They have shale bedrock at a depth of 20 to 40 inches.

Typical pedon of Montevallo channery silt loam, 20 to 35 percent slopes; 1,500 feet northeast of Salem Church on Log Mountain Road:

Oi—1 inch to 0; mat of leaves and twigs in various stages of decomposition.

A—0 to 2 inches; brown (10YR 4/3) channery silt loam; weak fine granular structure; very friable; common fine and medium roots; 35 percent shale channers as much as 1 inch across; strongly acid; abrupt smooth boundary.

Bw—2 to 13 inches; brownish yellow (10YR 6/6) very channery silt loam; weak fine subangular blocky structure; very friable; common fine and medium roots; 45 percent shale channers as much as 3 inches across; strongly acid; clear wavy boundary.

C—13 to 18 inches; brownish yellow (10YR 6/6) extremely channery silt loam; massive; very friable; few fine roots; 85 percent shale channers as much as 3 inches across; strongly acid; abrupt wavy boundary.

Cr—18 to 40 inches; tilted, moderately soft shale with lenses of yellowish brown silt loam between layers and in fractures.

The thickness of the solum and the depth to shale bedrock range from 10 to 20 inches. Reaction generally is very strongly acid to medium acid, but the surface layer is less acid where the soils have been limed. The content of shale fragments ranges from 20 to 35 percent in the A horizon, from 40 to 60 percent in the Bw horizon, and from 50 to 85 percent in the C horizon, if it occurs.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. Where this horizon has value of 3, it is less than 6 inches thick. The texture of the fine earth is silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The texture of the fine earth is silt loam or silty clay loam.

The C horizon, if it occurs, has colors like those of the Bw horizon. The texture of the fine earth is silt loam or loam.

Opequon Series

The Opequon series consists of shallow, well drained, steep and very steep soils on uplands. These soils formed in limestone residuum. Slopes range from 20 to 60 percent.

Opequon soils are geographically associated with banded limestone rock outcrops and with Montevallo, Talbott, and Townley soils. Montevallo soils are on shale uplands. They have more rock fragments and less clay in the subsoil than the Opequon soils. Talbott soils are on limestone uplands. They have limestone bedrock at a depth of 20 to 40 inches. Townley soils are on shale uplands. They have shale bedrock at a depth of 20 to 40 inches.

Typical pedon of Opequon silty clay loam, in an area of Opequon-Rock outcrop complex, 20 to 60 percent slopes; 4,000 feet north of Salem Church on Log Mountain Road; 100 feet southwest of road in a woods:

A—0 to 2 inches; brown (10YR 4/3) silty clay loam; moderate fine granular structure; friable; many fine and medium roots; mildly alkaline; clear smooth boundary.

Bt—2 to 17 inches; yellowish brown (10YR 5/4) silty clay; moderate coarse subangular blocky structure; firm; common fine, medium, and coarse roots; common fine pores; faint clay films on faces of peds and in pores; neutral; abrupt irregular boundary.

R—17 inches; hard limestone bedrock.

The thickness of the solum and the depth to bedrock range from 12 to 20 inches. Reaction is neutral or mildly alkaline. The content of rock fragments is less than 15 percent in all horizons.

The A horizon has hue of 10YR and value and chroma of 3 or 4. The texture is silty clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. The texture is silty clay, clay, or silty clay loam.

Sewanee Series

The Sewanee series consists of deep, moderately well drained, nearly level soils on flood plains. These soils formed in alluvium derived from sandstone and shale. Slopes range from 0 to 3 percent.

Sewanee soils are geographically associated with Jefferson and Wallen soils. Jefferson soils are on foot slopes and benches. They have more clay and less sand in the subsoil than the Sewanee soils and are well drained. Wallen soils are on uplands underlain by sandstone and shale. They have more rock fragments in the subsoil than the Sewanee soils and have bedrock at a depth of 20 to 40 inches.

Typical pedon of Sewanee loam, occasionally flooded, on Poor Valley Road, 2 miles east of Noah’s Chapel Church; 350 feet south of road in a woods, about 35 feet north of a creek:

A—0 to 4 inches; brown (10YR 4/3) loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary

Bw1—4 to 11 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; many fine, medium, and coarse roots; few fine and medium pores; very strongly acid; clear smooth boundary.

Bw2—11 to 21 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium faint brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; common fine and medium roots; few fine pores; very strongly acid; clear smooth boundary.

Bw3—21 to 33 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; common fine roots; few fine pores; very strongly acid; abrupt smooth boundary.

Cg1—33 to 44 inches; light brownish gray (10YR 6/2) sandy loam; many coarse distinct light yellowish brown (10YR 4/4) mottles; massive; friable; 5 percent small pebbles and shale fragments; very strongly acid; clear smooth boundary.

Cg2—44 to 50 inches; light brownish gray (10YR 6/2) gravelly sandy loam; many coarse distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; 20 percent sandstone gravel and shale fragments; very strongly acid; abrupt irregular boundary.

R—50 inches; unweathered, dark colored shale.

The thickness of the solum ranges from 25 to 40 inches. The depth to bedrock ranges from 40 to more than 60 inches. Reaction generally is very strongly acid or strongly acid, but the surface layer is less acid where the soils have been limed. The content of rock fragments ranges from 0 to 15 percent in the A and Bw horizons and is as much as 30 percent in the C horizon.

The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4. The texture is loam.

The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It has mottles in shades of gray within a depth of 24 inches. The texture is loam or fine sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4. It has mottles in shades of brown, yellow, or gray. The texture of the fine earth is sandy loam, fine sandy loam, or loam.

Shady Series

The Shady series consists of very deep, well drained, nearly level and gently sloping soils on low stream terraces. These soils formed in loamy alluvial sediments. Slopes range from 1 to 4 percent.

Shady soils are geographically associated with Waynesboro and Elk soils. Waynesboro soils are on high stream terraces and have a clayey subsoil. Elk soils are on low stream terraces below limestone bluffs and contain less sand than the Shady soils.

Typical pedon of Shady loam, 1 to 4 percent slopes, from the end of Mitchell Bend Road, 500 feet northeast of the Holston River and 50 feet west of a farm road:

Ap—0 to 7 inches; brown (10YR 4/3) loam; weak medium granular structure; very friable; many fine and medium and few coarse roots; few fine pores; medium acid; clear smooth boundary.

BA—7 to 15 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; common fine and medium and few coarse roots; few fine pores; medium acid; abrupt smooth boundary.

Bt1—15 to 24 inches; strong brown (7.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few fine and medium pores; few faint clay films on faces of peds and in pores; medium acid; clear smooth boundary.

Bt2—24 to 39 inches; strong brown (7.5YR 4/6) sandy clay loam; common fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; many fine and medium pores; common faint clay films on faces of peds and in pores; strongly acid; gradual smooth boundary.

Bt3—39 to 45 inches; strong brown (7.5YR 4/6) sandy clay loam; common fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine and medium pores; few faint clay films on faces of peds and in pores; few fine black concretions and stains; strongly acid; gradual smooth boundary.

C—45 to 60 inches; strong brown (7.5YR 4/6) sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; massive; very friable; few fine pores; few fine black concretions and stains; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 60 inches. Reaction generally is medium acid or strongly acid throughout the profile, but the surface layer is less acid where the soils have been limed. The content of rock fragments ranges from 0 to 10 percent throughout the profile.

The Ap horizon has hue of 10YR and value and chroma of 3 or 4. Where this horizon has value of 3, it is less than 6 inches thick. The texture is loam.

Some pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. It has mottles in shades of brown, yellow, or red. The texture is sandy clay loam, clay loam, or loam.

Some pedons have a transitional horizon between the Bt and C horizons.

The C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It has mottles in shades of brown, yellow, or gray. The texture generally is sandy loam or fine sandy loam, but in some pedons the horizon is stratified sandy loam, fine sandy loam, and loam.

Talbott Series

The Talbott series consists of moderately deep, well drained, sloping to very steep soils on uplands. These soils formed in limestone residuum. Slopes range from 5 to 50 percent.

Talbott soils are geographically associated with Bradyville, Opequon, and Townley soils. Bradyville and Opequon soils are in landscape positions similar to those of the Talbott soils. Bradyville soils have limestone bedrock at a depth of more than 40 inches, and Opequon soils have limestone bedrock within a depth of 20 inches. Townley soils are on shale uplands. They have shale bedrock within a depth of 40 inches.

Typical pedon of Talbott silty clay loam, in an area of

Talbott-Rock outcrop-Bradyville complex, 5 to 20 percent slopes, eroded; from Highway 11W, 1/2 mile south on Fennell Road; 150 feet west of road in a woods:

A—0 to 3 inches; brown (10YR 4/3) silty clay loam; weak medium granular structure; friable; common very fine, fine, and medium roots; few fine pores; 3 percent angular chert fragments; mildly alkaline; abrupt wavy boundary.

Bt1—3 to 9 inches; yellowish red (5YR 5/8) clay; moderate medium subangular blocky structure; firm; common very fine and few fine roots; few fine pores; few distinct clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—9 to 22 inches; yellowish red (5YR 5/8) clay; common medium distinct red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; common fine and medium and few very fine roots; few fine pores; few distinct clay films on faces of peds and in some of the larger pores; slightly acid; clear smooth boundary.

Bt3—22 to 27 inches; yellowish red (5YR 5/8) clay; many medium distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine pores; common distinct clay films on faces of peds and in pores; slightly acid; clear wavy boundary.

CB—27 to 32 inches; mottled red (2.5YR 4/8) and yellowish brown (10YR 5/6) clay; weak medium subangular blocky structure; firm; few faint clay films on faces of some peds; mildly alkaline; abrupt wavy boundary.

R—32 inches; limestone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction generally is strongly acid to slightly acid, but it ranges to mildly alkaline in the horizon directly above bedrock and in the surface layer where the soils have been limed. The content of chert fragments or limestone gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR or 7.5YR and value and chroma of 3 or 4. Where this horizon has value of 3, it is less than 6 inches thick. The texture is silty clay loam.

Some pedons have a transitional horizon between the A and Bt horizons.

The Bt horizon has hue generally of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons it has hue of 10YR in the lower part. This horizon commonly has mottles in shades of brown, yellow, or red. The texture generally is clay or silty clay, but in some pedons it is silty clay loam in the upper few inches of the horizon.

Some pedons have a transitional horizon or a thin C horizon between the Bt horizon and the underlying bedrock.

Townley Series

The Townley series consists of moderately deep, well drained, sloping to very steep soils on uplands. These soils formed in shale residuum. Slopes range from 5 to 60 percent.

Townley soils are geographically associated with Montevallo, Opequon, and Talbott soils. Montevallo soils are on shale uplands. They have shale bedrock at a depth of 10 to 20 inches. Opequon and Talbott soils are on limestone uplands. Opequon soils have limestone bedrock at a depth of 10 to 20 inches, and Talbott soils have limestone bedrock at a depth of 20 to 40 inches.

Typical pedon of Townley silt loam, in an area of Townley- Montevallo complex, 20 to 35 percent slopes; 1 mile north from the William Harrell Bridge on Tom Long Road; directly east of road in a woods:

Ap—0 to 4 inches; brown (10YR 4/3) silt loam; few fine faint brownish yellow (10YR 6/8) mottles; weak fine granular structure; very friable; many fine and medium roots; 10 percent fragments of shale; medium acid; clear wavy boundary.

Bt1—4 to 9 inches; brown (7.5YR 5/4) clay; common medium distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine, medium, and coarse roots; many fine and medium pores; few distinct clay films on faces of peds and in some of the larger pores; 10 percent fragments of shale; strongly acid; clear wavy boundary.

Bt2—9 to 17 inches; yellowish red (5YR 4/6) clay; common fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; many fine, medium, and coarse roots; common fine and medium pores; many distinct clay films on faces of peds and in pores; 10 percent fragments of shale; few fine black concretions; very strongly acid; gradual smooth boundary.

Bt3—17 to 28 inches; yellowish red (5YR 4/6) channery clay; common fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; common fine and medium pores; many distinct clay films on faces of peds and in pores; 25 percent fragments of shale; few fine black concretions; very strongly acid; abrupt irregular boundary.

C—28 to 33 inches; yellowish red (5YR 4/6) extremely channery clay; massive; friable; common distinct clay films on faces of shale fragments; 85 percent fragments of shale; very strongly acid; gradual wavy boundary.

Cr—33 to 50 inches; tilted and fractured, moderately hard shale bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction generally is extremely acid to strongly acid, but the surface layer is less acid where the soils have been limed. The content of rock fragments ranges from 0 to 30 percent in the solum.

The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4. Some pedons have a thin A horizon with value of 3 and chroma of 2 or 3. The texture of the fine earth is silt loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine earth is clay, silty clay, or silty clay loam.

The C horizon, if it occurs, has colors and fine earth textures like those of the Bt horizon. It has a higher content of rock fragments than the overlying horizons.

Wallen Series

The Wallen series consists of moderately deep, somewhat excessively drained, moderately steep to very steep soils on ridges and side slopes in the uplands. These soils formed in residuum or colluvium and residuum derived from sandstone and shale. Slopes range from 12 to 70 percent.

Wallen soils are geographically associated with Jefferson, Montevallo, and Townley soils. Jefferson soils are in coves and on foot slopes. They have more clay and fewer rock fragments in the subsoil than the Wallen soils and are more than 60 inches deep over bedrock. Montevallo and Townley soils are on shale uplands. Montevallo soils are less than 20 inches deep over shale bedrock. Townley soils have more clay and fewer rock fragments in the subsoil than the Wallen soils.

Typical pedon of Wallen gravelly loam, 35 to 70 percent slopes, on the Poor Valley Knobs, 3,000 feet northeast from the intersection of Highway 11W and Promised Land Hollow Road:

Oi—3 inches to 0; slightly decomposed hardwood litter.

A—0 to 2 inches; brown (10YR 4/3) gravelly loam; common fine faint dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; very friable; many fine and medium roots; 26 percent angular sandstone and shale channers; medium acid; abrupt smooth boundary.

Bw1—2 to 9 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine subangular blocky structure; very friable; many fine, medium, and coarse roots; few fine pores; 35 percent sandy shale channers; strongly acid; clear smooth boundary.

Bw2—9 to 16 inches; yellowish brown (10YR 5/6) very channery silt loam; common fine faint pale brown (10YR 6/3) and yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; common fine and many medium and coarse roots; common fine pores; 45 percent sandy shale channers; very strongly acid; abrupt smooth boundary.

BC—16 to 22 inches; yellowish brown (10YR 5/6) very channery silt loam; massive; very friable; few fine and very fine roots; 52 percent sandy shale channers as much as 4 inches across; very strongly acid; clear irregular boundary.

Cr—22 to 27 inches; weathered, interbedded shale and fine grained sandstone.

R—27 inches; hard, fine grained sandstone.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction ranges from very strongly acid to medium acid throughout the profile. The content of shale or sandstone fragments ranges from 15 to 35 percent in the A horizon and from 35 to 70 percent in the Bw, BC, and C horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Some pedons have an E horizon, which has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The texture of the fine earth is loam in the A and E horizons.

The Bw horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. The texture of the fine earth is loam, fine sandy loam, silt loam, or sandy loam.

The BC horizon and the C horizon, if it occurs, have colors and fine earth textures like those of the Bw horizon. Some pedons do not have a Cr horizon.

Waynesboro Series

The Waynesboro series consists of very deep, well drained, sloping to moderately steep soils on high stream terraces. These soils formed in mixed alluvial sediments derived from limestone, sandstone, and shale. Slopes range from 5 to 20 percent.

Waynesboro soils are geographically associated with Elk, Etowah, and Shady soils. Elk soils are on low stream terraces below limestone bluffs. They have less clay and more silt in the subsoil than the Waynesboro soils and are less acid. Etowah soils are in concave areas and on foot slopes. They have less clay in the subsoil than the Waynesboro soils. Shady soils are on low stream terraces. They have less clay and more sand in the subsoil than the Waynesboro soils.

Typical pedon of Waynesboro loam, 5 to 12 percent slopes, 2.1 miles from Nance Ferry Road on Mitchell Bend Road; in an exposed bank cut:

Ap—0 to 6 inches; brown (10YR 4/3) loam; few fine faint dark brown (10YR 3/3) mottles; weak fine and medium granular structure; very friable; many fine and few medium roots; medium acid; clear smooth boundary.

Bt1—6 to 16 inches; red (2.5YR 4/8) clay loam; many fine distinct yellowish red (5YR 5/8) mottles; moderate fine subangular blocky structure; friable; many fine roots; common fine pores; common distinct clay films on faces of peds and in pores; common very fine black concretions; strongly acid; gradual smooth boundary.

Bt2—16 to 34 inches; red (2.5YR 4/6) sandy clay; many fine distinct yellowish red (5YR 5/6) and common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common fine roots; common fine pores; common distinct clay films on faces of peds and in pores; common fine black concretions; strongly acid; clear smooth boundary.

Bt3—34 to 60 inches; red (2.5YR 4/8) clay; many fine distinct yellowish red (5YR 5/8) and common medium prominent strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid where the soils have been limed. The content of rock fragments ranges from 0 to 10 percent throughout the profile.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. The texture is loam.

Some pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 2.5YR or 5YR, value generally of 4 or 5, and chroma of 6 or 8. In some pedons the middle and lower parts of this horizon have value of 3. The texture is clay loam, clay, or sandy clay.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

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.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 2
Low	2 to 4
Moderate	4 to 6
High	more than 6

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

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.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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 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.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

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.

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.

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.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic).—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated).—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

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 ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

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.

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.

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.

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.

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.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

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.

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).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The 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	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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.

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.

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
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

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.

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.

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.

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.

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.

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.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1953-88 at Jefferson City, Tennessee)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January---	44.2	22.7	33.5	65	-13	0	2.86	1.02	4.39	6	4.1
February--	52.3	28.5	40.4	75	4	0	4.10	3.12	5.01	8	2.9
March-----	62.1	34.0	48.1	81	15	26	2.52	1.54	3.39	6	.0
April-----	68.5	40.8	54.7	87	19	177	3.11	1.50	4.49	8	2.2
May-------	79.0	52.5	65.8	89	33	490	4.69	1.80	7.10	9	.0
June------	85.5	60.4	73.0	93	43	690	3.78	2.46	4.97	6	.0
July------	87.8	64.6	76.2	97	54	812	4.05	1.45	6.19	6	.0
August----	86.7	64.2	75.5	97	49	791	3.35	1.89	4.64	6	.0
September-	81.6	55.6	68.6	92	36	558	2.21	.73	3.42	4	.0
October---	72.2	46.7	59.5	88	28	332	2.22	1.02	3.24	5	.0
November--	60.7	37.3	49.0	81	16	114	3.33	1.71	4.73	7	.0
December--	50.1	29.2	39.7	72	4	45	3.43	1.74	4.89	8	1.2
Yearly:											
Average--	69.2	44.7	57.0	---	---	---	---	---	---	---	---
Extreme--	---	---	---	98	-13	---	---	---	---	---	---
Total----	---	---	---	---	---	4,035	39.65	34.06	44.97	79	10.4

* 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 1953-88 at Jefferson City, Tennessee)

Probability	Temperature: 24 °F or lower	Temperature: 28 °F or lower	Temperature: 32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 16	May 1	May 15
2 years in 10 later than--	Apr. 4	Apr. 20	May 3
5 years in 10 later than--	Mar. 11	Mar. 29	Apr. 10
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 9	Sep. 29	Sep. 17
2 years in 10 earlier than--	Oct. 24	Oct. 14	Oct. 3
5 years in 10 earlier than--	Nov. 22	Nov. 13	Nov. 4

Table 3.--Growing Season

(Recorded in the period 1953-88 at Jefferson City, 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	211	193	171
8 years in 10	222	200	179
5 years in 10	244	215	193
2 years in 10	279	233	210
1 year in 10	269	239	211

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
BeC	Bellamy loam, 5 to 12 percent slopes	1,884	1.0
Bm	Bloomingdale silty clay loam, frequently flooded	427	0.2
BrD2	Bradyville-Rock outcrop-Talbott complex, 5 to 20 percent slopes, eroded	4,597	2.4
DeB2	Dewey silt loam, 2 to 5 percent slopes, eroded	1,096	0.6
DeC2	Dewey silt loam, 5 to 12 percent slopes, eroded	9,667	5.0
DeE3	Dewey silty clay loam, 20 to 35 percent slopes, severely eroded	2,714	1.4
DtD	Dewey-Etowah complex, 12 to 20 percent slopes	11,826	6.1
DtE	Dewey-Etowah complex, 20 to 35 percent slopes	16,867	8.7
Ek	Elk silt loam	1,106	0.6
EtB	Etowah silt loam, 2 to 5 percent slopes	656	0.3
EtC	Etowah silt loam, 5 to 12 percent slopes	2,649	1.4
FuC2	Fullerton gravelly loam, 5 to 12 percent slopes, eroded	2,863	1.5
FuD2	Fullerton gravelly loam, 12 to 20 percent slopes, eroded	3,108	1.6
FuE2	Fullerton gravelly loam, 20 to 35 percent slopes, eroded	13,235	6.8
Ha	Hamblen silt loam, frequently flooded	3,222	1.7
JeC	Jefferson loam, 5 to 12 percent slopes	1,655	0.8
JeD	Jefferson loam, 12 to 20 percent slopes	2,172	1.1
JeE	Jefferson loam, 20 to 35 percent slopes	1,755	0.9
MnD	Minvale loam, 12 to 20 percent slopes	9,363	4.8
MnE	Minvale loam, 20 to 35 percent slopes	3,149	1.6
MoC	Montevallo channery silt loam, 5 to 12 percent slopes	905	0.5
MoD	Montevallo channery silt loam, 12 to 20 percent slopes	790	0.4
MoE	Montevallo channery silt loam, 20 to 35 percent slopes	1,310	0.7
MoF	Montevallo channery silt loam, 35 to 60 percent slopes	1,748	0.9
OpE	Opequon-Rock outcrop complex, 20 to 60 percent slopes	6,922	3.6
Se	Sewanee loam, occasionally flooded	664	0.3
ShB	Shady loam, 1 to 4 percent slopes	694	0.4
TbD2	Talbott-Rock outcrop-Bradyville complex, 5 to 20 percent slopes, eroded	12,860	6.6
TbE2	Talbott-Rock outcrop-Bradyville complex, 20 to 50 percent slopes, eroded	8,358	4.3
TeC	Townley silt loam, 5 to 12 percent slopes	4,002	2.1
TmD	Townley-Montevallo complex, 12 to 20 percent slopes	3,932	2.0
TmE	Townley-Montevallo complex, 20 to 35 percent slopes	6,694	3.5
TmF	Townley-Montevallo complex, 35 to 60 percent slopes	12,052	6.2
WaD	Wallen gravelly loam, 12 to 20 percent slopes	278	0.1
WaE	Wallen gravelly loam, 20 to 35 percent slopes	2,143	1.1
WaF	Wallen gravelly loam, 35 to 70 percent slopes	11,225	5.8
WrE	Wallen-Rock outcrop complex, 20 to 35 percent slopes	837	0.4
WrF	Wallen-Rock outcrop complex, 35 to 70 percent slopes	10,608	5.5
WyC2	Waynesboro loam, 5 to 12 percent slopes, eroded	709	0.4
WyD2	Waynesboro loam, 12 to 20 percent slopes, eroded	758	0.4
	Water	12,200	6.3
	Total	193,700	100.0

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. 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*
BeC: Bellamy	IIIe	95	34	2,200	45	3.4	7.0
Bm: Bloomingdale	IVw	75	34	---	---	---	6.5
BrD2: Bradyville-Rock outcrop-Talbott	VIs	---	---	---	---	---	4.5
DeB2: Dewey	IIe	95	36	2,600	50	4.2	7.5
DeC2: Dewey	IIIe	85	32	2,300	45	3.8	7.0
DeE3: Dewey	VIe	---	---	---	---	---	5.0
DtD: Dewey-Etowah	IVe	75	28	2,000	40	3.4	6.0
DtE: Dewey-Etowah	VIe	---	---	---	---	---	5.5
Ek: Elk	I	130	46	3,000	65	4.6	8.5
EtB: Etowah	IIe	115	42	2,800	60	4.4	8.0
EtC: Etowah	IIIe	100	38	2,600	55	4.2	7.5
FuC2: Fullerton	IIIe	75	---	1,900	40	3.0	6.0
FuD2: Fullerton	IVe	---	---	---	35	2.6	5.5
FuE2: Fullerton	VIe	---	---	---	---	---	4.5
Ha: Hamblen	IIIw	90	36	---	---	---	8.0
JeC: Jefferson	IIIe	85	34	2,300	45	4.0	7.0
JeD: Jefferson	IVe	75	---	2,000	40	3.6	6.5
JeE: Jefferson	VIe	---	---	---	---	---	5.5

See footnote at end of table.

Table 5.--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*
MnD------------- Minvale	IVe	70	---	1,900	40	3.2	6.5
MnE------------- Minvale	VIe	---	---	---	---	---	5.5
MoC------------- Montevallo	IVe	---	---	---	30	---	3.5
MoD------------- Montevallo	VIe	---	---	---	---	---	3.0
MoE, MoF-------- Montevallo	VIIe	---	---	---	---	---	---
OpE------------- Opequon-Rock outcrop	VIIs	---	---	---	---	---	---
Se-------------- Sewanee	IIw	90	40	---	---	---	7.5
ShB------------- Shady	IIe	120	44	2,700	60	4.4	8.0
TbD2------------ Talbott-Rock outcrop-Bradyville	VIs	---	---	---	---	---	4.0
TbE2------------ Talbott-Rock outcrop-Bradyville	VIIs	---	---	---	---	---	3.5
TeC------------- Townley	IVe	---	---	---	40	---	5.5
TmD------------- Townley-Montevallo	VIe	---	---	---	---	---	4.5
TmE, TmF-------- Townley-Montevallo	VIIe	---	---	---	---	---	3.5
WaD------------- Wallen	VIs	---	---	---	---	---	4.5
WaE, WaF-------- Wallen	VIIs	---	---	---	---	---	3.5
WrE, WrF-------- Wallen-Rock outcrop	VIIs	---	---	---	---	---	---
WyC2------------ Waynesboro	IIIe	90	34	2,300	50	3.6	7.0

See footnote at end of table.

Table 5.--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*
WyD2------------ Waynesboro	IVe	80	---	2,000	45	3.2	6.5

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6.--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	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
BeC------------- Bellamy	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- Northern red oak---- Sweetgum-----------	95 75 90	100 57 100	Yellow-poplar, sweetgum, loblolly pine.
Bm-------------- Bloomingdale	Slight	Severe	Severe	Slight	Severe	Water oak---------- Sweetgum-----------	80 80	72 86	Sweetgum, American sycamore.
BrD2:									
Bradyville-----	Moderate	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, black walnut.
Rock outcrop.									
Talbott--------	Slight	Slight	Slight	Slight	Moderate	Northern red oak---- Shortleaf pine------ Eastern redcedar----	65 64 46	43 100 57	Loblolly pine, eastern redcedar, Virginia pine, black walnut.
DeB2, DeC2------ Dewey	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- White oak---------- Northern red oak---- Shortleaf pine------ Virginia pine-------	90 70 70 73 70	86 57 57 114 114	Yellow-poplar, black walnut, loblolly pine, eastern white pine.
DeE3------------ Dewey	Moderate	Moderate	Slight	Slight	Moderate	White oak---------- Northern red oak---- Shortleaf pine------ Virginia pine-------	70 73 73 70	57 57 114 114	Loblolly pine, eastern white pine, eastern redcedar.
DtD, DtE:									
Dewey----------	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar------- White oak---------- Northern red oak---- Shortleaf pine------ Virginia pine-------	90 70 70 73 70	86 57 57 114 114	Yellow-poplar, black walnut, loblolly pine, eastern white pine.
Etowah---------	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar------- Northern red oak---- Shortleaf pine------	90 80 80	86 57 129	Yellow-poplar, loblolly pine, black walnut.
Ek-------------- Elk	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- Pin oak------------ Red maple---------- American sycamore--- Black walnut-------- Sweetgum-----------	94 96 --- --- --- 98	100 86 --- --- --- 129	Eastern white pine, yellow-poplar, black walnut, loblolly pine, northern red oak.
EtB------------- Etowah	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- Northern red oak----	90 80	86 57	Yellow-poplar, loblolly pine.
EtC------------- Etowah	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- Northern red oak----	90 80	86 57	Yellow-poplar, loblolly pine.

See footnote at end of table.

Table 6.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
FuC2------------ Fullerton	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	90	86	Yellow-poplar, loblolly pine.
						Northern red oak----	70	57	
						Shortleaf pine------	67	100	
FuD2, FuE2------ Fullerton	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar-------	90	86	Yellow-poplar, loblolly pine.
						Northern red oak----	70	57	
						Shortleaf pine------	67	100	
Ha-------------- Hamblen	Slight	Slight	Moderate	Slight	Severe	Yellow-poplar-------	100	114	Loblolly pine, yellow-poplar.
						Northern red oak----	80	57	
JeC------------- Jefferson	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine------	65	100	Eastern white pine, yellow-poplar, white oak, shortleaf pine.
						Yellow-poplar-------	98	100	
						Pitch pine----------	---	---	
						Virginia pine-------	70	114	
						White oak-----------	---	---	
JeD, JeE-------- Jefferson	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak----	85	57	Yellow-poplar, eastern white pine, shortleaf pine.
						Yellow-poplar-------	108	114	
						Shortleaf pine------	---	---	
						White oak-----------	---	---	
MnD, MnE-------- Minvale	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar-------	90	86	Yellow-poplar, black walnut, loblolly pine.
						White oak-----------	70	57	
						Shortleaf pine------	70	114	
						Virginia pine-------	70	114	
MoC------------- Montevallo	Slight	Slight	Moderate	Moderate	Slight	Shortleaf pine------	61	86	Loblolly pine, shortleaf pine, Virginia pine.
						Virginia pine-------	61	86	
MoD, MoE-------- Montevallo	Moderate	Moderate	Moderate	Moderate	Slight	Shortleaf pine------	61	86	Loblolly pine, Virginia pine, shortleaf pine.
						Virginia pine-------	61	86	
MoF------------- Montevallo	Severe	Severe	Severe	Moderate	Slight	Shortleaf pine------	61	86	Loblolly pine, Virginia pine, shortleaf pine.
						Virginia pine-------	61	86	
OpE:									
Opequon--------	Severe	Severe	Severe	Severe	Moderate	Northern red oak----	60	43	Virginia pine, eastern white pine.
						White oak-----------	60	43	
						Sugar maple---------	---	---	
Rock outcrop.									
Se-------------- Sewanee	Slight	Slight	Slight	Slight	Severe	Yellow-poplar-------	100	114	Loblolly pine, yellow-poplar, eastern white pine.
						Shortleaf pine------	80	129	
						Sweetgum------------	90	100	
						Eastern white pine--	90	172	
ShB------------- Shady	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	100	114	Yellow-poplar, black walnut, loblolly pine.
						Northern red oak----	80	57	
						White oak-----------	80	57	
						Hickory-------------	---	---	

See footnote at end of table.

Table 6.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
TbD2:									
Talbott	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	65	43	Loblolly pine, shortleaf pine, eastern redcedar.
						Shortleaf pine	64	100	
						Eastern redcedar	46	57	
Rock outcrop.									
Bradyville	Slight	Moderate	Slight	Slight	Moderate	Northern red oak	70	57	Loblolly pine, shortleaf pine, eastern redcedar.
						White oak	70	57	
						Eastern redcedar	40	43	
TbE2:									
Talbott	Severe	Severe	Slight	Slight	Moderate	Northern red oak	65	43	Loblolly pine, shortleaf pine, eastern redcedar.
						Shortleaf pine	64	100	
						Eastern redcedar	46	57	
Rock outcrop.									
Bradyville	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	70	57	Loblolly pine, shortleaf pine, eastern redcedar.
						White oak	70	57	
						Eastern redcedar	40	43	
TeC Townley	Slight	Moderate	Slight	Moderate	Moderate	Virginia pine	70	114	Loblolly pine, Virginia pine.
						Shortleaf pine	60	86	
TmD, TmE:									
Townley	Moderate	Moderate	Moderate	Moderate	Moderate	Virginia pine	70	114	Loblolly pine, Virginia pine.
						Shortleaf pine	60	86	
Montevallo	Moderate	Moderate	Moderate	Moderate	Slight	Shortleaf pine	61	86	Loblolly pine, Virginia pine.
						Virginia pine	61	86	
TmF:									
Townley	Severe	Severe	Severe	Moderate	Moderate	Virginia pine	70	114	Loblolly pine, Virginia pine.
						Shortleaf pine	60	86	
Montevallo	Severe	Severe	Severe	Moderate	Slight	Shortleaf pine	61	86	Loblolly pine, Virginia pine.
						Virginia pine	61	86	
WaD, WaE Wallen	Slight	Moderate	Moderate	Moderate	Slight	Northern red oak	60	43	Shortleaf pine, Virginia pine.
						Shortleaf pine	60	86	
						Virginia pine	65	100	
WaF Wallen	Moderate	Severe	Moderate	Moderate	Slight	Northern red oak	60	43	Shortleaf pine, Virginia pine.
						Shortleaf pine	60	86	
						Virginia pine	65	100	
WrE:									
Wallen	Slight	Moderate	Moderate	Moderate	Slight	Northern red oak	60	43	Shortleaf pine, Virginia pine.
						Shortleaf pine	60	86	
						Virginia pine	65	100	
Rock outcrop.									

See footnote at end of table.

Table 6.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
WrF:									
Wallen	Moderate	Severe	Moderate	Moderate	Slight	Northern red oak	60	43	Shortleaf pine, Virginia pine.
						Shortleaf pine	60	86	
						Virginia pine	65	100	
Rock outcrop.									
WyC2 Waynesboro	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	86	Yellow-poplar, shortleaf pine, loblolly pine, black walnut.
						Northern red oak	70	57	
						White oak	70	57	
WyD2 Waynesboro	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	86	Yellow-poplar, shortleaf pine, loblolly pine, black walnut.
						Northern red oak	70	57	
						White oak	70	57	

* 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.

Table 7.--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
BeC: Bellamy	Moderate: slope, wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Bm: Bloomingdale	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
BrD2:					
Bradyville	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Rock outcrop.					
Talbott	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope, depth to rock.
DeB2: Dewey	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
DeC2: Dewey	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
DeE3: Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DtD:					
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
DtE:					
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ek: Elk	Slight	Slight	Slight	Slight	Slight.
EtB: Etowah	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
EtC: Etowah	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
FuC2: Fullerton	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
FuD2: Fullerton	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
FuE2: Fullerton	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Ha: Hamblen	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
JeC: Jefferson	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
JeD: Jefferson	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
JeE: Jefferson	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
MnD: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MnE: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MoC: Montevallo	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight	Severe: droughty.
MoD: Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
MoE, MoF: Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
OpE:					
Opequon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					
Se: Sewanee	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
ShB: Shady	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
TbD2:					
Talbott	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope, depth to rock.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TbD2:					
Rock outcrop.					
Bradyville	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
TbE2:					
Talbott	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
Bradyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
TeC Townley	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope, small stones.	Slight	Moderate: depth to rock, slope.
TmD:					
Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
TmE, TmF:					
Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
WaD Wallen	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
WaE, WaF Wallen	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
WrE, WrF:					
Wallen	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
WyC2 Waynesboro	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
WyD2 Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

Table 8.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BeC: Bellamy	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Bm: Bloomingdale	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BrD2:										
Bradyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
Talbott	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DeB2: Dewey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DeC2: Dewey	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DeE3: Dewey	Very poor.	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Poor	Poor	Very poor.
DtD:										
Dewey	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Etowah	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DtE:										
Dewey	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Etowah	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ek: Elk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EtB: Etowah	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EtC: Etowah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FuC2: Fullerton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FuD2: Fullerton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FuE2: Fullerton	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ha----------------- Hamblen	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
JeC---------------- Jefferson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
JeD---------------- Jefferson	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
JeE---------------- Jefferson	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MnD---------------- Minvale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MnE---------------- Minvale	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
MoC, MoD----------- Montevallo	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MoE, MoF----------- Montevallo	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
OpE:										
Opequon-----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
Se----------------- Sewanee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ShB---------------- Shady	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TbD2:										
Talbott-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										
Bradyville--------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TbE2:										
Talbott-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
Bradyville--------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TeC---------------- Townley	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TmD:										
Townley-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
TmD:										
Montevallo	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
TmE, TmF:										
Townley	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Montevallo	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
WaD Wallen	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
WaE, WaF Wallen	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
WrE, WrF:										
Wallen	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
WyC2 Waynesboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WyD2 Waynesboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 9.--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
BeC: Bellamy	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: wetness, slope.
Bm: Bloomingdale	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
BrD2:						
Bradyville	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Rock outcrop.						
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.
DeB2: Dewey	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
DeC2: Dewey	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
DeE3: Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DtD, DtE:						
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ek: Elk	Moderate: too clayey.	Slight	Slight	Slight	Severe: low strength.	Slight.
EtB: Etowah	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.	Slight.
EtC: Etowah	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
FuC2: Fullerton	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Severe: small stones.

Table 9.--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
FuD2, FuE2: Fullerton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Ha: Hamblen	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
JeC: Jefferson	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
JeD, JeE: Jefferson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MnD, MnE: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MoC: Montevallo	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: droughty.
MoD, MoE, MoF: Montevallo	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
OpE:						
Opequon	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.
Rock outcrop.						
Se: Sewanee	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
ShB: Shady	Slight	Slight	Slight	Slight	Slight	Slight.
TbD2:						
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.						
Bradyville	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
TbE2:						
Talbott	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						

Table 9.--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
TbE2:						
Bradyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
TeC Townley	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: depth to rock, slope.
TmD, TmE, TmF:						
Townley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Montevallo	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
WaD, WaE, WaF Wallen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
WrE, WrF:						
Wallen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
WyC2 Waynesboro	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WyD2 Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 10.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "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	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BeC: Bellamy	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
Bm: Bloomingdale	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
BrD2:					
Bradyville	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Rock outcrop.					
Talbott	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.
DeB2: Dewey	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
DeC2: Dewey	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
DeE3: Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
DtD, DtE:					
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Ek: Elk	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey, thin layer.
EtB: Etowah	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
EtC: Etowah	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey.

Table 10.--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
FuC2---------------- Fullerton	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Poor: small stones.
FuD2, FuE2---------- Fullerton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Ha------------------ Hamblen	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
JeC----------------- Jefferson	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, small stones, slope.
JeD, JeE------------ Jefferson	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
MnD, MnE------------ Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MoC----------------- Montevallo	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
MoD, MoE, MoF------- Montevallo	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
OpE:					
Opequon------------	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.
Rock outcrop.					
Se------------------ Sewanee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness.	Fair: wetness.
ShB----------------- Shady	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
TbD2:					
Talbott------------	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.					
Bradyville---------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.

Table 10.--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
TbE2:					
Talbott	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.					
Bradyville	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
TeC Townley	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
TmD, TmE, TmF:					
Townley	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Montevallo	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
WaD, WaE, WaF Wallen	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.
WrE, WrF:					
Wallen	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.
Rock outcrop.					
WyC2 Waynesboro	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
WyD2 Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

Table 11.--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
BeC: Bellamy	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
Bm: Bloomingdale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
BrD2:				
Bradyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Rock outcrop.				
Talbott	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
DeB2, DeC2: Dewey	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
DeE3: Dewey	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
DtD:				
Dewey	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Etowah	Fair: low strength, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
DtE:				
Dewey	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Etowah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ek: Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
EtB: Etowah	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EtC------------------- Etowah	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.
FuC2------------------ Fullerton	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
FuD2------------------ Fullerton	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
FuE2------------------ Fullerton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Ha-------------------- Hamblen	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
JeC------------------- Jefferson	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
JeD------------------- Jefferson	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
JeE------------------- Jefferson	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MnD------------------- Minvale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MnE------------------- Minvale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MoC------------------- Montevallo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
MoD------------------- Montevallo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
MoE, MoF-------------- Montevallo	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
OpE:				
Opequon	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop.				
Se Sewanee	Fair: depth to rock, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Moderate: small stones.
ShB Shady	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
TbD2:				
Talbott	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rock outcrop.				
Bradyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
TbE2:				
Talbott	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
Bradyville	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
TeC Townley	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TmD:				
Townley	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Montevallo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
TmE, TmF:				
Townley	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
TmE, TmF:				
Montevallo	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
WaD Wallen	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
WaE, WaF Wallen	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
WrE, WrF:				
Wallen	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
Rock outcrop.				
WyC2 Waynesboro	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WyD2 Waynesboro	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

Table 12.--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-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
BeC: Bellamy	Severe: slope.	Severe: piping.	Slope	Slope, wetness, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
Bm: Bloomingdale	Moderate: seepage.	Severe: hard to pack, wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
BrD2:						
Bradyville	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Rock outcrop.						
Talbott	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
DeB2: Dewey	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
DeC2, DeE3: Dewey	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
DtD, DtE:						
Dewey	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
Etowah	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Ek: Elk	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
EtB: Etowah	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
EtC: Etowah	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
FuC2, FuD2, FuE2: Fullerton	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope	Slope, large stones.	Large stones, slope.
Ha: Hamblen	Moderate: seepage.	Severe: piping.	Flooding	Wetness, flooding.	Wetness	Favorable.
JeC, JeD: Jefferson	Severe: seepage.	Severe: piping.	Deep to water	Slope	Slope, soil blowing.	Slope.

Table 12.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
JeE: Jefferson	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, soil blowing.	Slope.
MnD, MnE: Minvale	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
MoC, MoD, MoE, MoF: Montevallo	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
OpE: Opequon	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop.						
Se: Sewanee	Moderate: seepage, depth to rock.	Severe: piping, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
ShB: Shady	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.
TbD2, TbE2: Talbott	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop.						
Bradyville	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
TeC: Townley	Severe: slope.	Slight	Deep to water	Slope, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
TmD, TmE, TmF: Townley	Severe: slope.	Slight	Deep to water	Slope, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Montevallo	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
WaD, WaE, WaF: Wallen	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
WrE, WrF: Wallen	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop.						

Table 12.--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
WyC2, WyD2-------- Waynesboro	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope----------	Slope----------	Slope.

Table 13.--Engineering Index Properties

(The symbol < means less than. Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
BeC-------------- Bellamy	0-13	Loam-------------	ML, CL-ML, CL	A-4	0	90-100	85-100	75-100	55-85	20-35	2-10
	13-42	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	75-100	55-85	25-40	6-16
	42-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	75-100	55-85	25-40	6-16
Bm--------------- Bloomingdale	0-12	Silty clay loam	CL-ML, CL	A-4, A-6	0	95-100	90-100	85-100	60-95	25-40	5-15
	12-60	Silty clay loam, silty clay, clay.	ML, MH, CL, CH	A-7, A-6	0	95-100	95-100	90-100	85-95	35-55	12-30
BrD2:											
Bradyville------	0-3	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	70-95	65-90	15-35	3-15
	3-39	Silty clay, clay	CH, MH	A-7	0-5	80-100	75-100	65-90	60-85	52-70	26-40
	39-51	Silty clay, clay	CH, MH	A-7	0-10	80-100	75-100	65-90	60-85	52-70	26-40
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Talbott---------	0-3	Silty clay loam	CL, CH	A-6, A-7	0-5	95-100	90-100	85-95	80-95	35-60	12-32
	3-32	Clay, silty clay	CL, CH	A-7	0-10	95-100	90-100	85-95	80-95	41-80	20-45
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DeB2, DeC2------- Dewey	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	90-100	80-100	75-95	65-80	24-30	5-11
	6-26	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	26-62	Clay, silty clay	CH, CL, MH, ML	A-6, A-7	0-2	85-100	75-100	70-95	65-85	38-68	12-34
DeE3------------- Dewey	0-5	Silty clay loam	CL	A-6	0	90-100	80-100	75-95	70-80	25-39	12-20
	5-20	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	20-62	Clay, silty clay	CH, CL, MH, ML	A-6, A-7	0-2	85-100	75-100	70-95	65-85	38-68	12-34
DtD, DtE:											
Dewey-----------	0-4	Silt loam--------	CL-ML, CL	A-4, A-6	0	90-100	80-100	75-95	65-80	24-30	5-11
	4-24	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	24-62	Clay, silty clay	CH, CL, MH, ML	A-6, A-7	0-2	85-100	75-100	70-95	65-85	38-68	12-34
Etowah----------	0-10	Silt loam--------	ML, CL, SC-SM, CL-ML	A-4	0	80-100	75-100	70-95	45-70	20-30	3-10
	10-42	Silty clay loam, clay loam, silt loam.	CL	A-6	0	80-100	75-100	70-95	65-85	25-35	10-15
	42-62	Silty clay loam, silty clay, clay.	CL, ML, MH	A-6, A-7	0	80-100	75-100	70-95	65-85	39-60	15-25

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Ek--------------- Elk	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	8-60	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
EtB-------------- Etowah	0-10	Silt loam--------	ML, CL, SC-SM, CL-ML	A-4	0	80-100	75-100	70-95	45-70	20-30	3-10
	10-42	Silty clay loam, clay loam, silt loam.	CL	A-6	0	80-100	75-100	70-95	65-85	25-35	10-15
	42-60	Silty clay loam, silty clay, clay.	CL, ML, MH	A-6, A-7	0	80-100	75-100	70-95	65-85	39-60	15-25
EtC-------------- Etowah	0-10	Silt loam--------	ML, CL, SC-SM, CL-ML	A-4	0	80-100	75-100	70-95	45-70	20-30	3-10
	10-42	Silty clay loam, clay loam, silt loam.	CL	A-6	0	80-100	75-100	70-95	65-85	25-35	10-15
	42-62	Silty clay loam, silty clay, clay.	CL, ML, MH	A-6, A-7	0	80-100	75-100	70-95	65-85	39-60	15-25
FuC2, FuD2, FuE2- Fullerton	0-5	Gravelly loam----	GM-GC, CL-ML, CL, GC	A-2, A-4	2-15	60-94	45-80	40-75	30-70	18-30	3-10
	5-60	Gravelly clay, gravelly silty clay.	MH, ML, GM, SM	A-2, A-7	2-18	60-90	45-80	40-75	30-75	48-78	20-42
Ha--------------- Hamblen	0-8	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0-2	90-100	80-100	65-95	55-85	22-38	3-14
	8-17	Silt loam, loam, clay loam.	CL, CL-ML, ML	A-4, A-6	0-2	80-100	75-100	60-95	55-85	22-40	3-17
	17-60	Silt loam, loam, clay loam.	CL, CL-ML, ML, GC	A-4, A-6, A-2	0-5	55-100	45-95	35-90	30-80	22-40	3-17
JeC, JeD, JeE---- Jefferson	0-16	Loam, silt loam--	ML, CL, CL-ML	A-4	0-5	85-100	80-95	70-90	50-70	20-35	2-10
	16-60	Loam, clay loam, gravelly clay loam, gravelly sandy clay loam, sandy clay loam.	SM, SC, ML, CL	A-4, A-6	0-5	75-100	70-95	55-85	35-65	15-35	2-15
MnD, MnE--------- Minvale	0-14	Loam-------------	ML, CL, CL-ML	A-4	0-5	75-95	75-90	65-85	55-75	<30	NP-10
	14-36	Gravelly silty clay loam, gravelly silt loam, gravelly loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	50-75	50-75	40-70	36-65	20-40	5-15
	36-60	Gravelly silty clay loam, gravelly silty clay, gravelly clay.	CL, ML, GC, SC	A-4, A-6, A-7	0-5	55-80	50-75	40-70	36-65	25-50	7-23

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
MoC, MoD, MoE, MoF-------------- Montevallo	0-2	Channery silt loam.	SC-SM, SC, CL-ML, CL	A-4	0-5	60-88	50-75	45-70	40-65	<30	NP-10
	2-18	Very channery silt loam, extremely channery silt loam.	GM-GC, GC, SC-SM, SC	A-2, A-4, A-6, A-1	0-5	35-70	23-50	15-45	15-40	20-40	2-15
	18-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
OpE: Opequon----------	0-2	Silty clay loam	CL, MH, CH	A-6, A-7	0-5	85-100	80-100	80-100	75-95	30-55	10-30
	2-17	Silty clay loam, clay, silty clay.	CH, MH, CL	A-6, A-7	0-10	80-100	60-100	60-100	55-95	35-65	15-40
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Se---------------- Sewanee	0-4	Loam-------------	ML, CL-ML, SM	A-4	0-2	80-100	75-100	55-90	35-65	<30	NP-7
	4-33	Loam, silt loam, fine sandy loam.	ML, CL-ML, CL, SM	A-4	0-3	80-100	75-100	65-95	36-65	<35	NP-10
	33-50	Loam, gravelly sandy loam, sandy loam.	ML, CL, SM, SC	A-4, A-2	0-5	60-100	55-100	45-95	25-70	<30	NP-10
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
ShB-------------- Shady	0-15	Loam-------------	ML, CL-ML, SM	A-2, A-4	0-5	80-100	75-100	60-95	30-75	<30	NP-7
	15-45	Clay loam, sandy clay loam, loam.	CL, ML, CL-ML, SC	A-4, A-6	0-5	80-100	75-100	65-100	36-80	20-35	2-15
	45-60	Loam, gravelly loam, sandy loam.	SM, SC-SM, ML	A-2, A-4	0-20	65-100	60-95	40-85	20-60	<30	NP-7
TbD2, TbE2: Talbott----------	0-3	Silty clay loam	CL, CH	A-6, A-7	0-5	95-100	90-100	85-95	80-95	35-60	12-32
	3-32	Clay, silty clay	CL, CH	A-7	0-10	95-100	90-100	85-95	80-95	41-80	20-45
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Bradyville-------	0-3	Silt loam---------	ML, CL, CL-ML	A-4, A-6	0-5	80-100	75-100	70-95	65-90	15-35	3-15
	3-39	Silty clay, clay	CH, MH	A-7	0-5	80-100	75-100	65-90	60-85	52-70	26-40
	39-51	Silty clay, clay	CH, MH	A-7	0-10	80-100	75-100	65-90	60-85	52-70	26-40
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TeC-------------- Townley	0-4	Silt loam---------	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	15-35	NP-10
	4-28	Silty clay, channery clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-37
	28-33	Variable----------	---	---	---	---	---	---	---	---	---
	33-50	Weathered bedrock	---	---	---	---	---	---	---	---	---

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
TmD, TmE, TmF:											
Townley	0-4	Silt loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	15-35	NP-10
	4-28	Silty clay, channery clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-37
	28-33	Variable	---	---	---	---	---	---	---	---	---
	33-50	Weathered bedrock	---	---	---	---	---	---	---	---	---
Montevallo	0-2	Channery silt loam.	SC-SM, SC, CL-ML, CL	A-4	0-5	60-88	50-75	45-70	40-65	<30	NP-10
	2-18	Very channery silt loam, extremely channery silt loam.	GM-GC, GC, SC-SM, SC	A-2, A-4, A-6, A-1	0-5	35-70	23-50	15-45	15-40	20-40	2-15
	18-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
WaD, WaE, WaF: Wallen	0-2	Gravelly loam	ML, SM, CL-ML, SC-SM	A-2, A-4	2-15	70-85	60-80	40-70	30-55	<35	NP-10
	2-22	Very cobbly loam, very cobbly silt loam, very channery fine sandy loam.	GM, GM-GC, SC-SM, SM	A-2, A-4, A-1	25-55	35-65	30-60	20-50	10-40	<35	NP-10
	22-27	Weathered bedrock	---	---	---	---	---	---	---	---	---
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
WrE, WrF:											
Wallen	0-3	Gravelly fine sandy loam.	ML, SM, CL-ML, SC-SM	A-2, A-4	2-15	70-85	60-80	40-70	30-55	<35	NP-10
	3-28	Very cobbly loam, very cobbly sandy loam.	GM, GM-GC, SC-SM, SM	A-2, A-4, A-1	25-55	35-65	30-60	20-50	10-40	<35	NP-10
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
WyC2, WyD2: Waynesboro	0-6	Loam	ML, CL-ML, CL, SM	A-4	0-5	85-100	80-100	70-95	43-70	18-30	2-9
	6-16	Clay loam, loam, sandy clay loam.	CL, SC	A-4, A-6, A-7	0-5	90-100	85-100	75-95	45-75	30-41	9-17
	16-60	Clay loam, sandy clay, clay.	MH, CL, ML	A-4, A-6, A-7	0-5	90-100	80-100	70-98	55-75	35-68	9-32

Table 14.--Physical and Chemical Properties of the Soils

(The symbol < means less 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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
BeC---------------	0-13	12-25	1.35-1.50	0.6-2.0	0.16-0.22	4.5-6.0	Low----------	0.37	5	1-2
Bellamy	13-42	18-32	1.45-1.60	0.2-0.6	0.14-0.18	4.5-6.0	Low----------	0.32		
	42-60	18-32	1.40-1.55	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.32		
Bm----------------	0-12	18-30	1.10-1.30	0.6-2.0	0.17-0.22	5.6-8.4	Low----------	0.37	5	1-3
Bloomingdale	12-60	35-60	1.30-1.50	0.6-2.0	0.17-0.22	5.6-8.4	Moderate-----	0.37		
BrD2:										
Bradyville------	0-3	18-27	1.40-1.55	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.43	3	.5-2
	3-39	40-60	1.30-1.50	0.2-0.6	0.10-0.15	5.1-6.0	Moderate-----	0.28		
	39-51	48-60	1.30-1.50	0.2-0.6	0.10-0.15	5.1-7.8	Moderate-----	0.28		
	51	---	---	---	---	---	---	---		
Rock outcrop.										
Talbott---------	0-3	32-50	1.35-1.55	0.6-2.0	0.10-0.16	5.1-6.0	Moderate-----	0.32	2	<1
	3-32	40-60	1.40-1.60	0.2-0.6	0.10-0.14	5.1-6.0	Moderate-----	0.24		
	32	---	---	---	---	---	---	---		
DeB2, DeC2--------	0-6	17-27	1.35-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low----------	0.32	5	.5-2
Dewey	6-26	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.24		
	26-62	45-60	1.45-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.24		
DeE3--------------	0-5	32-45	1.40-1.50	0.6-2.0	0.14-0.19	4.5-5.5	Low----------	0.28	5	<1
Dewey	5-20	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.24		
	20-62	45-60	1.45-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.24		
DtD, DtE:										
Dewey-----------	0-4	17-27	1.35-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low----------	0.32	5	.5-2
	4-24	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Moderate-----	0.24		
	24-62	45-60	1.45-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Moderate-----	0.24		
Etowah----------	0-10	15-27	1.30-1.45	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.37	5	1-3
	10-42	23-35	1.35-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
	42-62	32-45	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
Ek----------------	0-8	10-27	1.20-1.40	0.6-2.0	0.19-0.23	4.5-6.5	Low----------	0.37	5	.5-2
Elk	8-60	18-34	1.20-1.50	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.28		
EtB---------------	0-10	15-27	1.30-1.45	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.37	5	1-3
Etowah	10-42	23-35	1.35-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
	42-60	32-45	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
EtC---------------	0-10	15-27	1.30-1.45	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.37	5	1-3
Etowah	10-42	23-35	1.35-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
	42-62	32-45	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.32		
FuC2, FuD2, FuE2-	0-5	15-27	1.45-1.55	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.28	5	.5-2
Fullerton	5-60	40-70	1.45-1.55	0.6-2.0	0.10-0.14	4.5-5.5	Moderate-----	0.20		
Ha----------------	0-8	15-25	1.30-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Low----------	0.32	5	1-3
Hamblen	8-17	18-32	1.30-1.45	0.6-2.0	0.17-0.20	5.1-7.3	Low----------	0.32		
	17-60	18-32	1.30-1.45	0.6-2.0	0.17-0.20	5.1-7.3	Low----------	0.32		

Table 14.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
JeC, JeD, JeE---- Jefferson	0-16	10-20	1.30-1.50	2.0-6.0	0.10-0.18	4.5-5.5	Low----------	0.24	4	.5-2
	16-60	18-34	1.30-1.65	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.28		
MnD, MnE--------- Minvale	0-14	15-30	1.30-1.45	0.6-2.0	0.16-0.22	4.5-5.5	Low----------	0.32	5	.5-2
	14-36	20-35	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28		
	36-60	25-45	1.40-1.55	0.6-2.0	0.11-0.17	4.5-5.5	Low----------	0.28		
MoC, MoD, MoE, MoF------------- Montevallo	0-2	7-27	1.25-1.45	0.6-2.0	0.09-0.18	4.5-6.0	Low----------	0.28	1	.5-2
	2-18	15-35	1.25-1.50	0.6-2.0	0.02-0.12	4.5-6.0	Low----------	0.32		
	18-40	---	---	---	---	---	---	---		
OpE: Opequon---------	0-2	27-45	1.20-1.50	0.2-2.0	0.16-0.21	5.1-7.8	High---------	0.32	1	1-3
	2-17	35-75	1.40-1.70	0.2-2.0	0.12-0.16	5.1-7.8	High---------	0.17		
	17	---	---	---	---	---	---	---		
Rock outcrop.										
Se--------------- Sewanee	0-4	10-18	1.35-1.55	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.28	3	1-3
	4-33	10-18	1.35-1.55	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
	33-50	10-18	1.35-1.55	0.6-2.0	0.10-0.18	4.5-5.5	Low----------	0.24		
	50	---	---	---	---	---	---	---		
ShB-------------- Shady	0-15	10-25	1.35-1.50	0.6-6.0	0.12-0.18	4.5-6.5	Low----------	0.28	5	1-3
	15-45	20-35	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low----------	0.28		
	45-60	8-20	1.40-1.60	0.6-6.0	0.09-0.15	4.5-6.0	Low----------	0.20		
TbD2, TbE2: Talbott---------	0-3	32-50	1.35-1.55	0.6-2.0	0.10-0.16	5.1-6.0	Moderate-----	0.32	2	<1
	3-32	40-60	1.40-1.60	0.2-0.6	0.10-0.14	5.1-6.0	Moderate-----	0.24		
	32	---	---	---	---	---	---	---		
Rock outcrop.										
Bradyville------	0-3	18-27	1.40-1.55	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.43	3	.5-2
	3-39	40-60	1.30-1.50	0.2-0.6	0.10-0.15	5.1-6.0	Moderate-----	0.28		
	39-51	48-60	1.30-1.50	0.2-0.6	0.10-0.15	5.1-7.8	Moderate-----	0.28		
	51	---	---	---	---	---	---	---		
TeC-------------- Townley	0-4	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low----------	0.37	2	.5-2
	4-28	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	28-33	---	---	---	---	---	---	---		
	33-50	---	---	---	---	---	---	---		
TmD, TmE, TmF: Townley---------	0-4	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low----------	0.37	2	.5-2
	4-28	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate-----	0.28		
	28-33	---	---	---	---	---	---	---		
	33-50	---	---	---	---	---	---	---		
Montevallo------	0-2	7-27	1.25-1.45	0.6-2.0	0.09-0.18	4.5-6.0	Low----------	0.28	1	.5-2
	2-18	15-35	1.25-1.50	0.6-2.0	0.02-0.12	4.5-6.0	Low----------	0.32		
	18-40	---	---	---	---	---	---	---		
WaD, WaE, WaF---- Wallen	0-2	8-20	1.40-1.55	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.17	2	.5-2
	2-22	8-20	1.40-1.55	2.0-6.0	0.05-0.09	4.5-6.0	Low----------	0.17		
	22-27	---	---	---	---	---	---	---		
	27	---	---	---	---	---	---	---		

Table 14.--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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
WrE, WrF:										
Wallen----------	0-3	8-20	1.40-1.55	2.0-6.0	0.07-0.12	4.5-6.0	Low----------	0.17	2	.5-2
	3-28	8-20	1.40-1.55	2.0-6.0	0.05-0.09	4.5-6.0	Low----------	0.17		
	28	---	---	---	---	---	---	---		
Rock outcrop.										
WyC2, WyD2------- Waynesboro	0-6	10-30	1.40-1.55	0.6-2.0	0.15-0.21	4.5-5.5	Low----------	0.28	5	.5-2
	6-16	23-35	1.40-1.55	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
	16-60	35-50	1.40-1.55	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.28		

Table 15.--Soil and Water Features

("Flooding," "water table," and such terms as "frequent," "brief," "apparent," and "perched" are explained in the text. The symbol > 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	Hard-ness	Uncoated steel	Concrete
					Ft			In			
BeC: Bellamy	C	None	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	Moderate	Moderate.
Bm: Bloomingdale	D	Frequent	Brief	Nov-May	0-1.0	Apparent	Nov-May	>60	---	High	Low.
BrD2:											
Bradyville	C	None	---	---	>6.0	---	---	40-60	Hard	High	Moderate.
Rock outcrop.											
Talbott	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
DeB2, DeC2, DeE3: Dewey	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
DtD, DtE:											
Dewey	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Etowah	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Ek: Elk	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
EtB, EtC: Etowah	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
FuC2, FuD2, FuE2: Fullerton	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Ha: Hamblen	C	Frequent	Very brief	Dec-Mar	2.0-3.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
JeC, JeD, JeE: Jefferson	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
MnD, MnE: Minvale	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
MoC, MoD, MoE, MoF: Montevallo	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
OpE:											
Opequon	C	None	---	---	>6.0	---	---	12-20	Hard	Moderate	Low.
Rock outcrop.											
Se: Sewanee	B	Occasional	Very brief	Dec-Mar	1.5-2.5	Apparent	Dec-Mar	40-60	Hard	Moderate	Moderate.
ShB: Shady	B	None	---	---	---	---	---	>60	---	Low	Moderate.

Table 15.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
TbD2, TbE2:											
Talbott	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Rock outcrop.											
Bradyville	C	None	---	---	>6.0	---	---	40-60	Hard	High	Moderate.
TeC Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
TmD, TmE, TmF:											
Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
Montevallo	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
WaD, WaE, WaF Wallen	B	None	---	---	>6.0	---	---	20-40	Hard	Low	High.
WrE, WrF:											
Wallen	B	None	---	---	>6.0	---	---	20-40	Hard	Low	High.
Rock outcrop.											
WyC2, WyD2 Waynesboro	B	None	---	---	>6.0	---	---	>60	---	High	High.

Table 16.--Classification of the Soils

Soil name	Family or higher taxonomic class
Bellamy	Fine-loamy, siliceous, thermic Aquic Hapludults
Bloomingdale	Fine, mixed, nonacid, thermic Typic Endoaquepts
Bradyville	Fine, mixed, thermic Typic Hapludalfs
Dewey	Clayey, kaolinitic, thermic Typic Paleudults
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Etowah	Fine-loamy, siliceous, thermic Typic Paleudults
Fullerton	Clayey, kaolinitic, thermic Typic Paleudults
Hamblen	Fine-loamy, siliceous, thermic Fluvaquentic Eutrochrepts
Jefferson	Fine-loamy, siliceous, mesic Typic Hapludults
Minvale	Fine-loamy, siliceous, thermic Typic Paleudults
Montevallo	Loamy-skeletal, mixed, thermic, shallow Typic Dystrochrepts
Opequon	Clayey, mixed, mesic Lithic Hapludalfs
Sewanee	Coarse-loamy, siliceous, mesic Fluvaquentic Dystrochrepts
Shady	Fine-loamy, mixed, thermic Typic Hapludults
Talbott	Fine, mixed, thermic Typic Hapludalfs
Townley	Clayey, mixed, thermic Typic Hapludults
Wallen	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
Waynesboro	Clayey, kaolinitic, thermic Typic Paleudults