United States Department of Agriculture

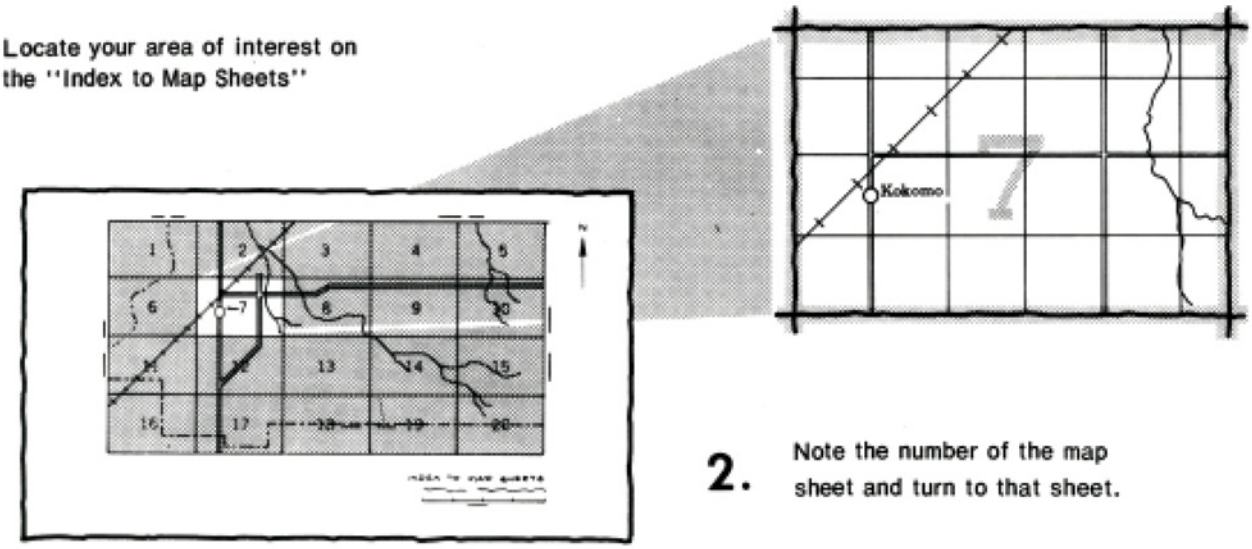
Soil Conservation Service

In cooperation with the Alabama Agricultural Experiment Station and the Alabama Soil and Water Conservation Committee

Soil Survey of St. Clair County Alabama

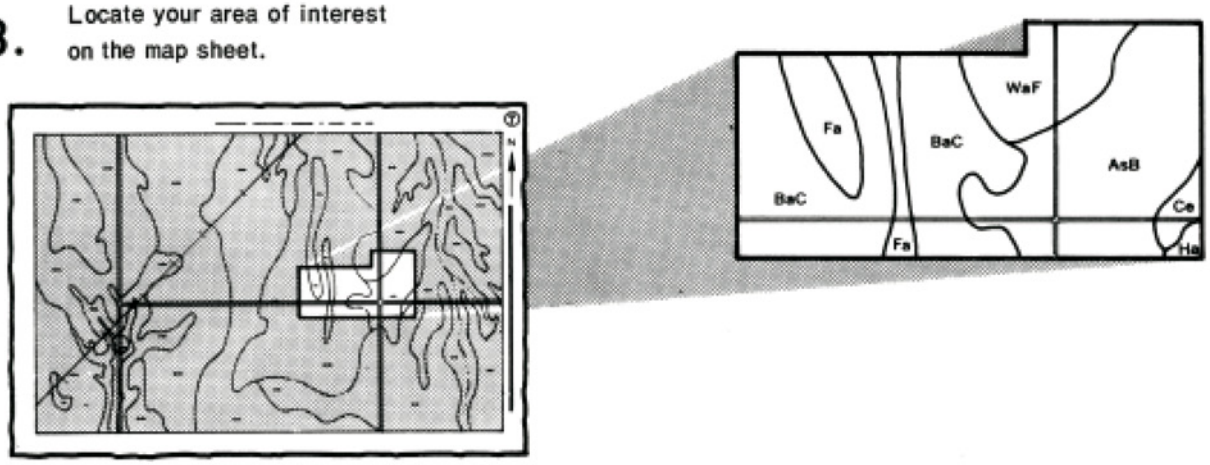
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

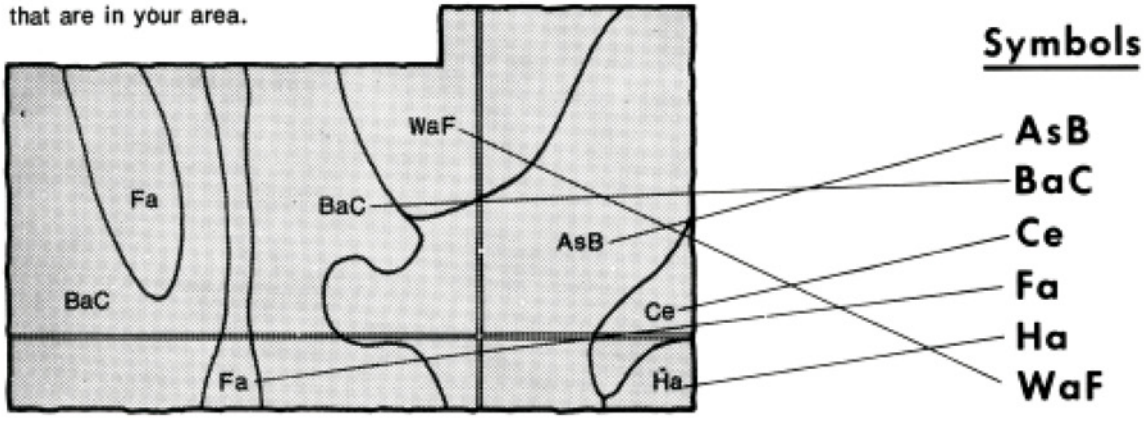


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

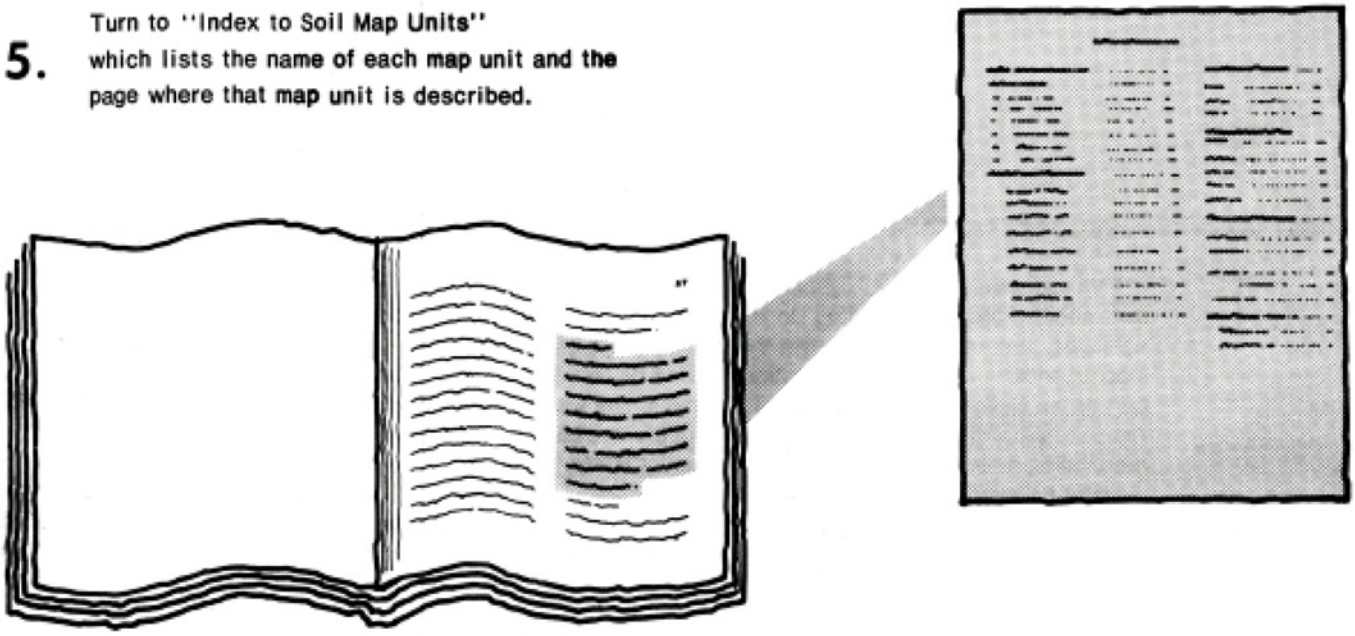


4. List the map unit symbols that are in your area.

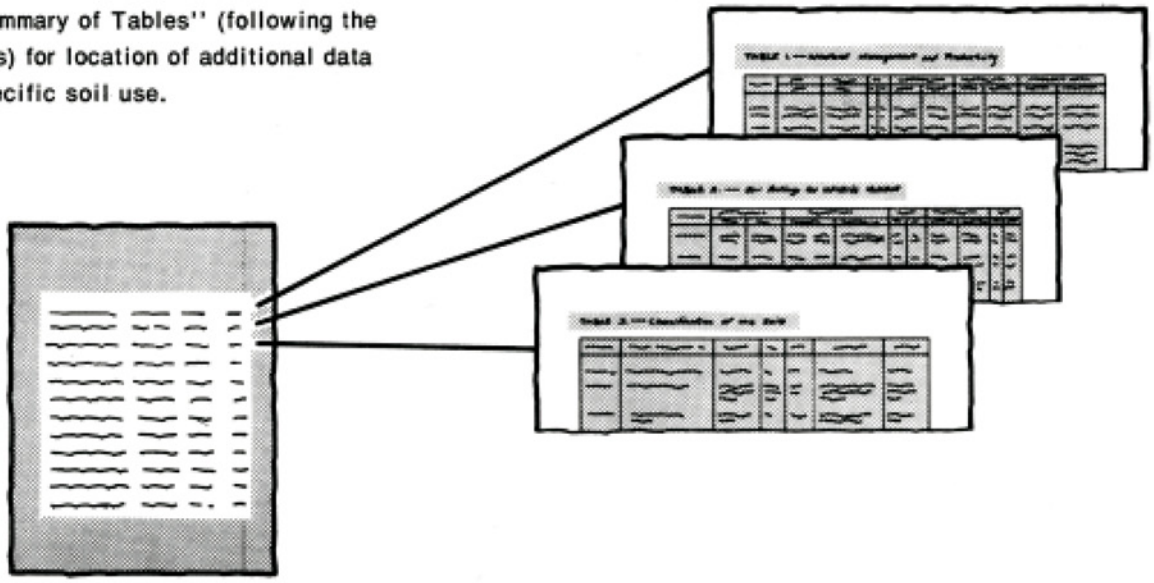


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

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 Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service and the Alabama Agricultural Experiment Station, the Alabama Cooperative Extension Service, the Alabama Soil and Water Conservation Committee, the Alabama Department of Agriculture and Industries, and the Alabama Surface Mining Reclamation Commission. It is part of the technical assistance furnished to the St. Clair County Soil and Water 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.

This soil survey supersedes a soil survey of St. Clair County published in 1920. This survey provides additional information and contains larger maps that show the soils in greater detail.

Cover: Fescue pasture on Wax loam, 0 to 3 percent slopes, and Cane loam, 8 to 12 percent slopes. The wooded area in the background is in an area of Minvale-Nella-Townley association, steep.

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Soil Series

Issued August 1985

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Summary of Tables

Foreword

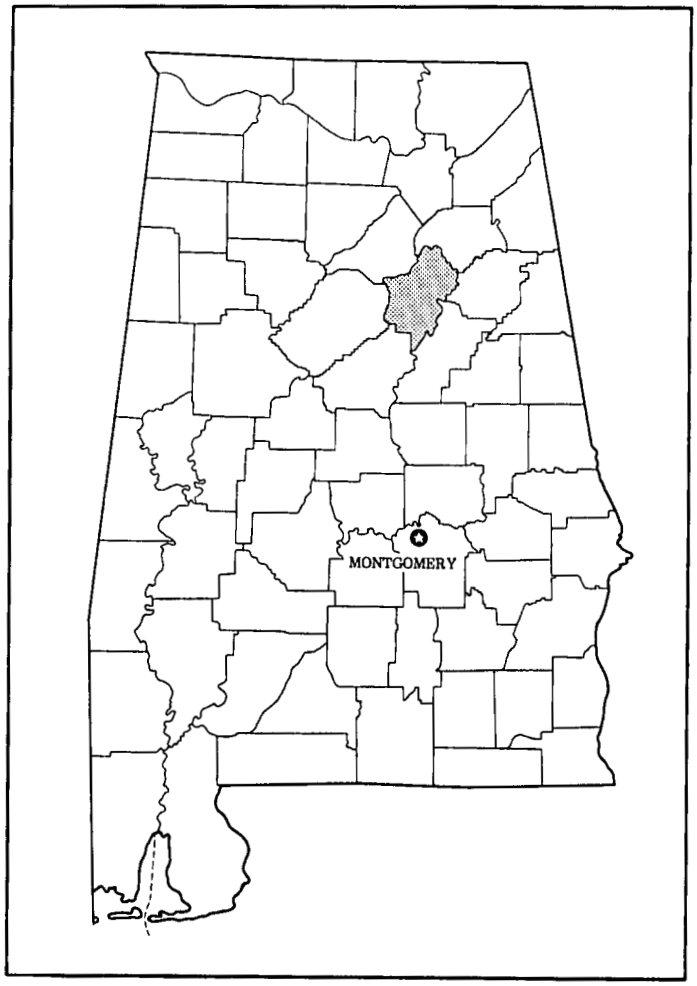
This soil survey contains information that can be used in land-planning programs in St. Clair County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact 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 insure 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.

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 Soil Conservation Service or the Cooperative Extension Service.

Ernest V. Todd
State Conservationist
Soil Conservation Service



Location of St. Clair County in Alabama.

Soil Survey of
St. Clair County, Alabama

By Charles F. Montgomery, Soil Conservation Service

Fieldwork by Charles F. Montgomery, Charles M. Owsley,
Delaney B. Johnson, and Harold B. Neal, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
In cooperation with the Alabama Agricultural Experiment Station
and the Alabama Soil and Water Conservation Committee

ST. CLAIR COUNTY is in the northeastern part of Alabama. Exclusive of water areas that are more than 40 acres in extent and of streams that are more than one-eighth of a mile wide, the county has a total area of 409,600 acres, or 640 square miles.

The county is in the Sand Mountain land resource area and the Southern Appalachian Ridges and Valleys land resource area. On Sand Mountain, the soils formed from shale and sandstone residuum. In the Southern Appalachian Ridges and Valleys, the soils formed from chert and limestone residuum, colluvium, and alluvium. Elevation ranges from about 400 feet in the southwestern part of the county to about 1,600 feet at Bald Rock on Backbone Mountain.

Many of the early settlers of St. Clair County had been stationed at Fort Strothers during the War of 1812. The fort had served as a garrison and supply depot during Andrew Jackson's campaign in south Alabama. Some of the soldiers took great notice of the fertile valleys to the north of Fort Strothers, and after the war they settled in Beaver Valley.

St. Clair County was formed in 1818. Ashville was the first town established in the county. In 1910, the population of the county was 20,175 *(8)*, and in 1980 the population was 41,000 *(4)*. Pell City and Ashville are the county seats.

The county is served by three railroads, by U.S. Highways 11, 78, 231, and 411 and Interstate Highways 20 and 59, and by many other state and local roads. The county is drained by the Coosa and Cahaba Rivers and their tributaries.

General Nature of the Survey Area

This section describes the natural resources, farming history, and climate of the county.

Natural Resources

Soil is the most important natural resource in the county. The livestock that graze the pasture, crops that are produced on farms, and timber that is produced on the woodlands are marketable products that are derived from the soil.

In most of the county, adequate water for domestic and livestock use is provided by the Coosa River and other perennial streams, supplemented by wells and springs. There also are many farm ponds throughout the county. Water recreation along Logan Martin Lake in the southern part of the county and Henry Lake in the northern part has become a major source of revenue.

Coal, iron, bauxite, barites, lead, chert, and limestone are all mined in the county, but coal is the most important. It occurs in two fields, the Coosa and Cahaba coal fields *(7)*.

Farming History

St. Clair County was originally covered with mixed forests of oak, hickory, longleaf and shortleaf pines, chestnut, walnut, and other hardwoods. The first settlers in the county produced mainly food crops, such as corn, oats, potatoes, wheat, vegetables, and rice. Some

tobacco was also grown in the county. However, cotton soon became the principal cash crop.

Beaver Valley and Shoal Creek Valley were the first two areas settled. The soils in these areas are used mostly as pasture or hayland.

In the northern and northwestern parts of the county, two sandstone plateaus, Chandler and Blount Mountains, were the next areas developed for agricultural crops. These plateaus are the most intensely farmed areas of the county. Soybeans is the main cash crop on Blount Mountain. Tomatoes, peppers, snap beans, and other vegetables are produced on Chandler Mountain.

St. Clair County has approximately 62,000 acres in forage crops, such as pasture, hay, and silage. About 4,000 acres of soybeans is planted in the county each year, and about 2,500 acres of tomatoes is cultivated *(19)*. Most of this acreage is located on Chandler Mountain. Farmers on the mountain plant approximately 100 acres of snap beans each year. St. Clair County also has a large poultry production each year, and several hundred acres are in turf production.

Most of the forest land in St. Clair County occupies two well known geologic formations, the Pottsville Formation and the Conasauga Formation. The Pottsville Formation is oriented northeast to southwest across the county between Ashville and Pell City. It also is in the Sanie, Acmar, and Low Gap areas of the county. The Conasauga Formation is between Springville and Steele. This area is commonly referred to as the flatwoods. Both of these geologic formations have large tracts of pine and hardwoods. Large acreages in these two regions are owned by several paper companies.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Pell City in the period 1960 to 1976. 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 42 degrees F, and the average daily minimum temperature is 29 degrees. The lowest temperature on record, which occurred at Pell City on January 24, 1963, is -3 degrees. In summer the average temperature is 76 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred at Pell City on August 31, 1970, 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 60 inches. Of this, 28 inches, or 47 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 25 inches. The heaviest 1-day rainfall during the period of record was 6.70 inches at Pell City on December 12, 1961. Thunderstorms occur on about 60 days each year, and most occur in summer.

The average seasonal snowfall is less than 1 inch. The greatest snow depth at any one time during the period of record was 3 inches. Rarely is there 1 inch of snow on the ground, but the number of such days could vary greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9 miles per hour, in winter.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; 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 has been changed very little by biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil 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-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, 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. 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 interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were 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 were 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 state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure 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.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. 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 soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns 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 (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

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

Survey Procedures

The general procedures followed in making this survey are described in the National Soils Handbook of the Soil Conservation Service. The Soil Survey of St. Clair County *(8)* published in 1920 and the Generalized

Geologic Map of St. Clair County, Alabama *(9)* were among the references used.

Before the actual fieldwork began, preliminary boundaries of landforms were plotted stereoscopically on quadcentered aerial photographs flown in 1976 at a scale of 1:80,000 and enlarged to a scale of 1:24,000. U.S. Geological Survey topographic maps at a scale of 1:24,000, photographs at the same scale and other scales, and soil surveys produced for conservation planning since 1920 were studied to relate land and image features. A vehicle reconnaissance was then made prior to traversing and transecting the surface.

General soil map units 1, 2, 3, and 4 were surveyed by a random transect method *(13)*, and random observations were made from a vehicle on the existing network of roads and trails.

Traverses were made on foot and from a vehicle in the rest of the survey area. Most of the traverses were made at intervals of about one-fourth mile. Traverses at closer intervals were made in areas of high variability and on Blount and Chandler Mountains. Some areas of high variability are in general soil maps units 10 and 11.

Soil examinations along the traverses were made 100 to 400 yards apart, depending on the landscape and soil pattern *(12)*. Observations of such items as landforms, trees blown down, vegetation, roadbanks, and animal burrows were made continuously without regard to spacing. Soil boundaries were determined on the basis of landform position, soil examinations, observations, and photo interpretation. The soil material was examined with the aid of a spade, a hand auger, or a truck probe to a depth of about 5 feet or to bedrock if the bedrock was at a depth of less than 5 feet. The pedons described as typical were observed and studied in pits that were dug by hand.

Samples for chemical and physical analyses and engineering test data were taken from the site of the typical pedon of some of the major soils in the survey area. The analyses were made by Auburn University, Auburn, Alabama, and by the State of Alabama Highway Department, Montgomery, Alabama. Some of the results of the analyses are published in this soil survey.

After completion of the soil mapping on quadcentered aerial photographs, map unit delineations were transferred by hand to orthophotographs at a scale of 1:24,000. Surface drainage was mapped in the field. Cultural features and section corners were transferred from U.S. Geological Survey topographic maps and were recorded from visual observations.

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, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units 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

Moderately steep to steep soils on mountains, dissected plateaus, and ridges

This group of map units consists of loamy and clayey soils. The soils are well drained and somewhat excessively drained.

The four map units in this group make up about 50 percent of the county. The soils are fairly suited to use as woodland and to recreation uses. They generally are poorly suited to farmland and to urban uses.

1. Nauvoo-Townley-Rock outcrop

Well drained, loamy and clayey soils formed in material weathered from sandstone and shale; and areas of exposed limestone and sandstone

This map unit makes up about 37 percent of the county. It is about 38 percent Nauvoo soils, 30 percent Townley soils, 8 percent Rock outcrop, and 24 percent soils of minor extent.

Nauvoo and Townley soils and Rock outcrop are on dissected plateaus throughout the county. The side slopes are rough. They are dissected by many drains. Some of the ridgetops are fairly wide and rolling. The ridges are in a northeasterly-southwesterly orientation. In most areas, the soils in this map unit are drained by small streams. The slopes are 20 to 40 percent.

Nauvoo soils generally are on the upper two-thirds of the southeast slopes. The surface layer is yellowish brown sandy loam. The subsoil is strong brown and yellowish red sandy clay loam.

Townley soils generally are on the lower two-thirds of the northwest slopes. The surface layer is brown silt loam. The subsoil is yellowish red silty clay and clay in the upper part. It is mottled, light brownish gray, pinkish gray, yellowish red, and red silty clay loam in the lower part.

Rock outcrop generally is on the upper one-third of the slopes and ridges. These outcrops of exposed limestone and sandstone range from a few inches in diameter to several feet. They generally occur at an elevation of about 800 feet.

Of minor extent in this map unit are Lobelville, Mooreville, Tanyard, and Nella soils. Lobelville, Mooreville, and Tanyard soils are on flood plains, and Nella soils are on ridges.

The soils in this map unit are used mainly as woodland (fig. 1). Some of the less sloping ridgetops have been cleared, and the soils are used for pasture.

2. Minvale-Nella-Bodine

Well drained and somewhat excessively drained, loamy soils formed in material weathered from chert, cherty limestone, and sandstone colluvium

This map unit makes up about 1 percent of the county. It is about 34 percent Minvale soils, 24 percent Nella soils, 21 percent Bodine soils, and 21 percent soils of minor extent.

Minvale, Nella, Bodine soils are on a chain-like series of mountains that have steep side slopes and narrow ridgetops. The steep side slopes are fairly smooth. This mountain chain has been cut by erosion that formed narrow gaps. The mountains are in a northeasterly-southwesterly orientation. The slopes are about 20 to 45 percent.

Minvale soils generally are on the southeast slopes and the upper one-third of the northwest slopes. These soils are well drained. The surface layer is dark grayish brown cherty loam. The subsoil is strong brown and yellowish red cherty silty clay loam.

Nella soils generally are on the northwest slopes. These soils are well drained. The surface layer is brown

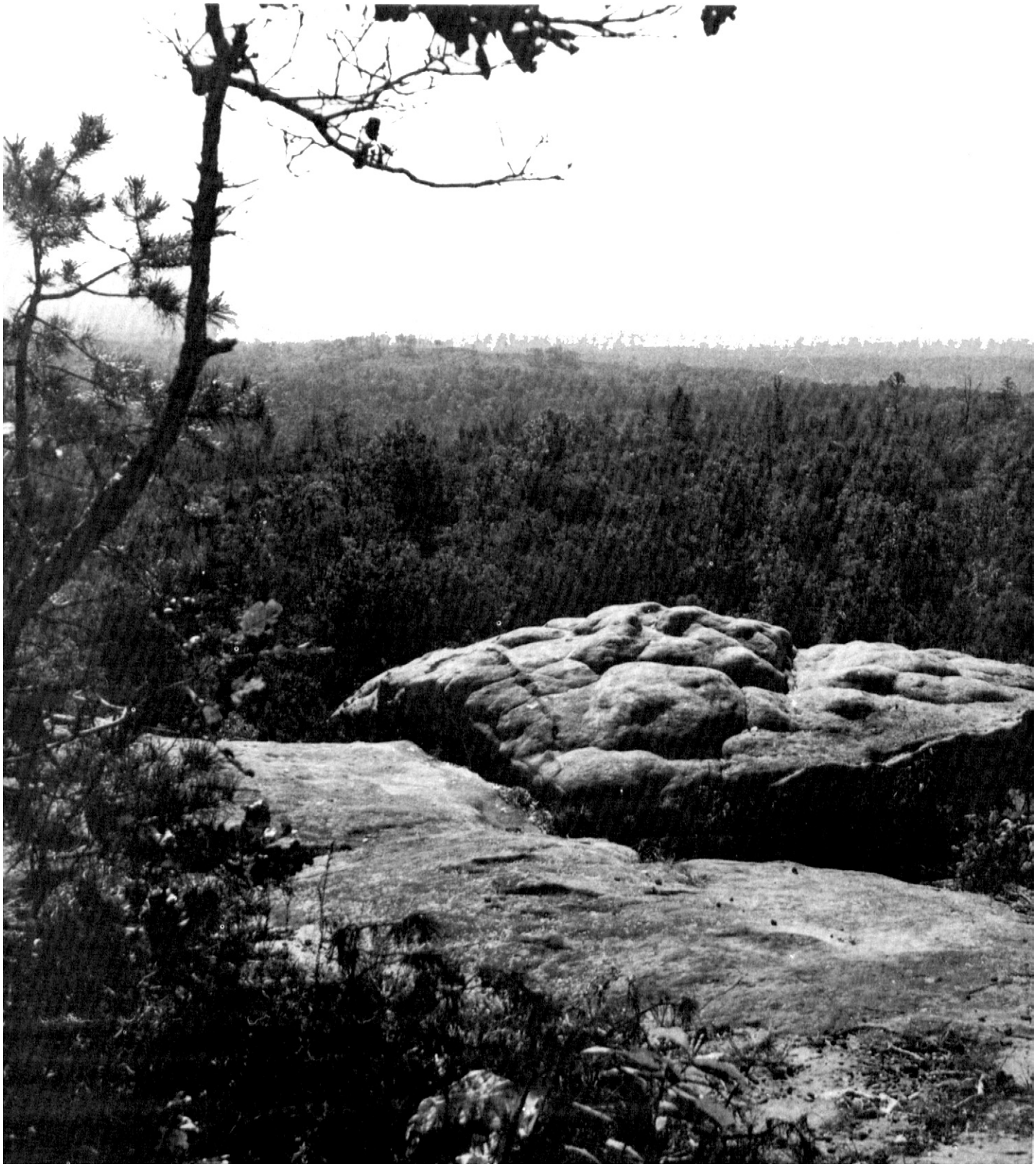


Figure 1.—Woodland is the main use of the soils in the Nauvoo-Townley-Rock outcrop map unit.

Figure 2.—The Minvale-Nella-Bodine soils in the background are used as woodland, and the Townley-Tasso-Wax soils in the foreground are used for pasture.

gravelly sandy loam. The subsoil is strong brown and yellowish red gravelly loam and clay loam.

Bodine soils generally are on the southeast slopes and upper part of the northwest slopes. They are somewhat excessively drained. The surface layer is dark grayish brown cherty loam. The subsoil is yellowish brown and strong brown very cherty loam and clay loam.

Of minor extent in this map unit are Allen, Cane, Tasso, and Townley soils. These soils are along the delineation boundaries on both sides of the ridges. Also in this map unit are areas of exposed, broken sandstone cobbles and boulders.

The soils in this map unit are used mainly as woodland (fig. 2). A few small areas have been cleared, and the soils are used for pasture.

3. Minvale-Nella-Townley

Well drained, loamy and clayey soils formed in material weathered from chert, cherty limestone, sandstone, colluvium, and shale

This map unit makes up about 10 percent of the county. It is about 34 percent Minvale soils, 27 percent Nella soils, 15 percent Townley soils, and 24 percent soils of minor extent.

Minvale, Nella, and Townley soils are on three long, narrow ridges and on a short, wide ridge. The side slopes are steep and rough. They are dissected by many drains. Some of the ridges have been cut by erosion in several places. The ridgetops generally are narrow. They are in a northeasterly-southwesterly orientation. The slopes are 20 to 45 percent.

Minvale soils generally are on the outer sides of ridges. The surface layer is brown cherty loam. The subsoil is yellowish brown, strong brown, and yellowish red cherty silty clay loam.

Nella soils generally are on the upper side slopes and ridgetops. The surface layer is dark yellowish brown

gravelly sandy loam. The subsoil is strong brown and yellowish red gravelly loam and clay loam.

Townley soils generally are on the upper side slopes and ridgetops. The surface layer is brown silt loam. The subsoil is strong brown and yellowish red clay.

Of minor extent in this map unit are Allen, Cane, Dewey, and Nauvoo soils and sandstone and limestone rock outcrop.

The soils in this map unit are used mainly as woodland. Some of the less sloping areas have been cleared, and the soils are used for pasture.

4. Minvale-Bodine

Well drained and somewhat excessively drained, loamy soils formed in material weathered from chert and cherty limestone

This map unit makes up about 2 percent of the county. It is about 69 percent Minvale soils, 25 percent Bodine soils, and 6 percent soils of minor extent.

Minvale and Bodine soils are on one long, narrow ridge that extends from the northeastern part of the county to the southwestern part. The ridge has been cut by erosion in several places. The landscape is steep and rough. The slopes are 15 to 40 percent.

Minvale soils generally are on the lower part of the northwest and southeast facing slopes. These soils are well drained. The surface layer is brown cherty loam. The subsoil is strong brown and yellowish red cherty silty clay loam.

Bodine soils are generally in high positions on the landscape. The soils are somewhat excessively drained. The surface layer is dark grayish brown cherty loam. The subsoil is brown, dark brown, and strong brown very cherty loam and clay loam.

Of minor extent in this map unit are the Townley soils. They are along the toe of delineations. Also in this map unit are small areas of cherty, cobble piles.

The soils in this map unit are used mainly as woodland. A few areas have been cleared, and the soils are used for pasture.

Undulating to hilly soils on plateaus and mountains

This map unit consists of loamy and clayey soils. The soils are well drained.

This unit makes up about 2 percent of the county. The soils have good to fair suitability for use as farmland and woodland and for recreation and urban uses.

5. Nauvoo-Townley

Well drained, loamy and clayey soils formed in material weathered from sandstone and shale

This map unit makes up about 2 percent of the county. It is about 60 percent Nauvoo soils, 20 percent Townley soils, and 20 percent soils of minor extent.

Nauvoo and Townley soils are on the Chandler and Blount Mountains in the northern part of the county. The tops of the mountains are fairly smooth. These plateaus have been dissected by erosion to form complex drainage patterns. In many areas, the drainageways have eroded and have exposed the sandstone and shale. The slopes are about 2 to 30 percent.

Nauvoo soils generally are on level landforms at high elevations. The surface layer is yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam.

Townley soils are generally on steep landforms along drainageways. The surface layer is brown silt loam. The subsoil is yellowish red silty clay and clay in the upper part. It is mottled, light brownish gray, pinkish gray, yellowish red, and red silty clay loam in the lower part.

Of minor extent in this map unit are Mooreville soils, a narrow band of deep, dark red clayey soil, and sandstone rock outcrop. The Mooreville soils are on the flood plains, and the dark red clayey soil is along the rim of the Chandler and Blount Mountains.

The soils in this map unit are used mainly for row crops and truck crops. Some of the steep areas along drainageways are used as woodland.

Undulating to hilly soils in valleys and on valley sides

This group of map units consists of loamy and clayey soils. The soils are well drained and moderately well drained.

The four map units in this group make up about 45 percent of the county. The soils are fairly suited to use as farmland. They have good to fair suitability for use as woodland and have good to poor suitability for recreation uses.

6. Minvale-Dewey

Well drained, loamy and clayey soils formed in material weathered from chert, cherty limestone, and limestone

This map unit makes up about 10 percent of the county. It is about 40 percent Minvale soils, 40 percent Dewey soils, and 20 percent soils of minor extent.

The Minvale and Dewey soils are on low, rolling upland ridges mainly in the southeastern part of the county. The side slopes are dissected by many drainageways. The ridgetops generally are smooth and rounded. In most areas, the soils of this map unit are drained by small streams and by the Coosa River. The slopes are dominantly 2 to 15 percent but range to 30 percent.

Minvale soils are generally on the side slopes but can be anywhere on the landscape. The surface layer is brown cherty loam. The subsoil is yellowish brown, strong brown, and yellowish red cherty loam and silty clay loam.

Dewey soils generally are on the ridgetops and top slopes but can be on the steep side slopes. The surface layer is brown loam. The subsoil is red to dark red silty clay loam and clay.

Figure 3.—Soils in the Minvale-Dewey map unit are suited to use for pasture and hay crops.

Of minor extent in this map unit are Bodine, Lobelville, and Mooreville soils. The Bodine soils are on the steep side slopes, and Lobelville and Mooreville soils are on the flood plains and in shallow depressions.

The soils in this map unit are used mainly for woodland, pasture, or hay crops (fig. 3). In a few areas, the soils are used for cultivated row crops.

7. Conasauga-Firestone

Moderately well drained and well drained, clayey soils formed in material weathered from shale

This map unit makes up about 9 percent of the county. It is about 49 percent Conasauga soils, 44 percent Firestone soils, and 7 percent soils of minor extent.

Conasauga and Firestone soils are on large, broad flats that have low ridges in the north-central part of the county. The drainageways are poorly defined in many areas. The low ridges generally are only a few feet higher in elevation than the surrounding landscape. The slopes are 1 to 15 percent.

Conasauga soils generally are in low positions on the landscape and along drainageways. They are moderately well drained. The surface layer is brown silt loam. The subsoil is strong brown silty clay in the upper part. It is mottled, yellowish brown silty clay in the lower part.

Firestone soils generally are on low ridges at high elevations within the delineations. These soils are well drained. The surface layer is yellowish brown silt loam. The subsoil is light olive brown and brownish yellow silt loam and clay in the upper part. It is mottled, brownish yellow silty clay in the lower part.

Of minor extent in this map unit are Gaylesville, Mooreville, and Tanyard soils. They are on flood plains and in depressions.

Soils in this map unit are used mainly as woodland and pasture. In a few areas, they are used for row crops.

8. Townley-Tasso-Wax

Well drained and moderately well drained, clayey and loamy soils formed in material weathered from shale, sandstone, alluvium, and colluvium

This map unit makes up about 11 percent of the county. It is about 55 percent Townley soils, 12 percent Tasso soils, 10 percent Wax soils, and 23 percent soils of minor extent.

Townley, Tasso, and Wax soils are in a long, broad valley that has toe slope landscapes along the outer edges and alluvial soils along the drainageways. Shoal Creek and Kelly Creek are the major drainageways in this map unit. The slopes are dominantly 0 to 15 percent but range to 30 percent.

Townley soils generally are between Tasso soils on the toe slopes and Wax soils on the stream terraces. Townley soils are well drained. The surface layer is brown silt loam. The subsoil is yellowish red silty clay and clay in the upper part. It is mottled, light brownish gray, pinkish gray, yellowish red, and red silty clay loam in the lower part.

Tasso soils generally are in colluvial positions along the northwest edge of the map unit. These soils are well drained and moderately well drained. The surface layer is brown sandy loam. The subsoil is yellowish brown gravelly loam in the upper part. It is mottled, yellowish red and pale brown, slightly compact and brittle sandy clay loam in the lower part.

Wax soils are on flood plains. They are moderately well drained. The surface layer is dark grayish brown loam. The subsoil is yellowish brown loam and cherty sandy clay loam in the upper part. It is mottled, light gray, yellowish brown, and pale brown, compact and brittle cherty sandy clay loam in the lower part.

Of minor extent in this map unit are Allen, Minvale, and Nella soils on the upland toe slopes and Mooreville and Tanyard soils on flood plains.

The soils in this map unit are used mainly as pasture and woodland. In a few areas, the soils are used for row crops.

9. Minvale-Cane-Wax

Well drained and moderately well drained, loamy soils formed in material weathered from chert, cherty limestone, sandstone, alluvium, and colluvium

This map unit makes up about 15 percent of the county. It is about 50 percent Minvale soils, 10 percent Cane soils, 10 percent Wax soils, and 30 percent soils of minor extent.

Minvale, Cane, and Wax soils are in a long, broad valley that has toe slopes along the outer edges and alluvial soils on the flood plains. Beaver Creek, Kelly Creek, and the Little Cahaba River are the major drainageways in the map unit. The slopes are 1 to about 15 percent.

Minvale soils generally are in colluvial positions along the northwest edge of the map unit. They are well drained. The surface layer is brown cherty loam. The subsoil is yellowish brown, strong brown, and yellowish red cherty loam and cherty silty clay loam in the upper part. The lower part of the subsoil is mottled, yellowish red cherty silty clay loam.

Cane soils generally are in colluvial positions along the southeast edge of the map unit. They are moderately well drained. The surface layer is brown loam. The subsoil is yellowish red and red loam and sandy clay loam. It is mottled and compact and brittle in the lower part.

Wax soils are on flood plains. They are moderately well drained. The surface layer is dark grayish brown loam. The subsoil is mixed light yellowish brown and dark grayish brown loam and yellowish brown loam in the upper part. It is mottled, yellowish brown and light gray, yellowish brown, and pale brown, compact and brittle cherty sandy clay loam in the lower part.

Of minor extent in this map unit are Allen, Dewey, and Townley soils on uplands and Mooreville and Tanyard soils on flood plains.

The soils in this map unit are used mainly as pasture (fig. 4) and woodland. In a few areas, the soils are used for row crops.

Nearly level and gently sloping soils on stream terraces and flood plains

This group of map units consists of clayey and loamy soils. The soils are well drained and moderately well drained.

The two map units in this group make up about 3 percent of the county. The soils have good to fair suitability for use as farmland and for recreation uses. They have good suitability for use as woodland and have good to poor suitability for urban uses.

10. Waynesboro-Holston

Well drained, clayey and loamy soils formed in alluvial material from shale, sandstone, and cherty limestone

This map unit makes up about 1 percent of the county. It is about 34 percent Waynesboro soils, 26 percent Holston soils, and 40 percent soils of minor extent.

Waynesboro and Holston soils are on stream terraces along the Coosa River. The landscape generally is smooth with short, steep escarpments. Drainageways are complex and are not well defined. The slopes are dominantly 2 to 8 percent but range to 15 percent.

Waynesboro soils are on low elevations and steep terrace escarpments. The surface layer is yellowish brown sandy loam. The subsoil is yellowish red clay and clay loam that is mottled in the lower part.

Holston soils are on the highest elevations of this unit. The surface layer is brown sandy loam. The subsoil is yellowish brown loam and clay loam in the upper part. It is mottled, yellowish brown and yellowish red clay loam in the lower part.

Of minor extent in this map unit are Nella soils on the high elevations and Choccolocco, Gaylesville, Lobelville, Mooreville, and Wax soils on flood plains and in depressions.

The soils in this unit are used mainly for row crops and as woodland.

Figure 4.—Soils in the Minvale-Cane-Wax map unit are used for pasture grasses and as woodland.

11. Choccolocco-Mooreville-Wax

Well drained and moderately well drained, loamy soils formed in alluvial deposits

This map unit makes up about 2 percent of the county. It is about 38 percent Choccolocco soils, 25 percent Mooreville soils, 12 percent Wax soils, and 25 percent soils of minor extent.

Choccolocco, Mooreville, and Wax soils are on stream terraces and flood plains along Canoe Creek. The landscape is smooth with numerous old channels and depressions. The main drainageway is Canoe Creek, but there are many back sloughs that have very poor outlets or have no outlets. The slopes are 0 to 3 percent.

Choccolocco soils generally are on stream terraces that are near the main drainageway. These soils are well drained. They have a brown silt loam surface layer. The subsoil is brown and dark yellowish brown silty clay, silty clay loam, and sandy clay loam. The lower part of the subsoil is mottled.

Mooreville soils are on flood plains and in low-lying depressional back sloughs. These soils are moderately well drained. The surface layer is dark grayish brown silt loam. The subsoil is mottled, brown and grayish brown silty clay loam and clay loam.

Wax soils mainly are in depressions. They are moderately well drained. The surface layer is dark grayish brown loam. The subsoil is yellowish brown loam and sandy clay loam. The lower part of the subsoil is mottled and is compact and brittle.

Of minor extent in this map unit are Gaylesville and Tanyard soils.

The soils in this map unit are used mainly as woodland and pasture.

Broad Land Use Considerations

The soils in the survey area vary widely in their suitability for major land uses. Table 4 shows the extent of the map units shown on the genral soil map. It lists the suitability of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil suitability ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that persist even if such practices are used.

Each map unit is rated for *cultivated crops, specialty crops, woodland, urban uses,* and *recreation areas.* Cultivated crops are those grown extensively in the survey area. Specialty crops are the vegetables and fruits that generally require intensive management. Woodland refers to areas of native or introduced trees. Urban uses include residential, commericial, and industrial developments. Intensive recreation areas are campsites, picnic areas, ballfields, and other areas that

are subject to heavy foot traffic. Extensive recreation areas are those used for nature study and as wilderness.

Urban development within the survey area increases each year, and land use decisions that deal with urban development are an important issue in this survey area. The western part of St. Clair County and the eastern part along the Coosa River are the two most rapidly developing areas. Soils and their suitability for urban use must be considered in the development of an area. The general soil map is a valuable tool which can be used for general planning in areas of urban growth. Onsite soil investigation should then be made for specific structures.

Two groups of soils in the county have characteristics that are unfavorable for urban development. Soils in the Conasauga-Firestone map unit have a high shrink-swell potential and slow permeability, and soils in the Choccolocco-Mooreville-Wax map unit are limited for most urban uses because of flooding and a seasonal high water table.

In large areas of the county are soils that can be developed for urban use at a lower cost than the soils named above. These include soils in the Minvale-Dewey map unit and the Waynesboro-Holston map unit and in parts of the Minvale-Cane-Wax map unit that do not have a seasonal high water table. Also included are soils in parts of the Nauvoo-Townley map unit that are moderately permeable.

In some areas, the soils have fair to good suitability for farming but poor suitability for nonfarm uses. These soils are in the Choccolocco-Mooreville-Wax map unit and in parts of the Nauvoo-Townley map unit and the Minvale-Cane-Wax map unit.

Areas that have good suitability for truck crops include some of the soils in the Nauvoo-Townley map unit and the Waynesboro-Holston map unit. Most of these soils have favorable surface texture, good soil moisture relationship, and respond well to fertilizer and management practices.

Most soils in the county have good or fair suitability for woodland. Trees that are commercially valuable are produced most rapidly on the deep, well drained soils in the county.

Most of the map units include soils that have good suitability as sites for parks and extensive recreation areas. The heavily wooded Nauvoo-Townley-Rock outcrop map unit is sparsely populated and provides good habitat for woodland wildlife. Also, the Minvale-Dewey map unit along the Logan Martin Reservoir or along the Coosa River has fair to good potential for intensive recreational development.

Detailed Soil Map Units

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

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil 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 or of the underlying material, 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 or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, 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, Minvale cherty loam, 2 to 8 percent slopes, is one of several phases in the Minvale series.

Some map units are made up of two or more major soils and are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Nella-Townley complex, 6 to 15 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Nauvoo-Townley association, steep, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Conasauga and Firestone silt loams, 1 to 8 percent slopes, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits and Dumps is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of 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.

Soil Descriptions

AeB—Allen gravelly sandy loam, 2 to 8 percent slopes. This deep, well drained, gently sloping soil is on hillsides and toe slopes. The slope is smooth and convex. Individual areas are 10 to 30 acres or more.

Typically, the surface layer is reddish brown gravelly sandy loam to a depth of about 5 inches. The subsoil is yellowish red sandy loam to a depth of 8 inches, yellowish red sandy clay loam to a depth of 26 inches, and yellowish red clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Allen soil, but they have a gravelly subsoil at a depth of more than 40 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Cane, Holston, Minvale, Mooreville, Nauvoo, and Wax soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Cane, Mooreville, and Wax soils are dissimilar to the Allen soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Allen soil primarily is used for cultivated crops and as pasture. In some areas, the soil is used as woodland or hayland.

This soil is suited to cultivated crops. Suitability is limited by the small size of most areas of this soil. Erosion is a moderate hazard. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is well suited to building site development. It also is well suited to use for sanitary facilities. Slope and seepage are moderate limitations for sewage lagoon areas. Permeability is a moderate limitation to use as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. There are no significant concerns in management for use of this soil for dwellings with or without basements. Low soil strength is a moderate limitation for use of this soil for local roads and streets.

This Allen soil is in land capability subclass IIe and in woodland ordination group 3o.

AeD—Allen gravelly sandy loam, 8 to 15 percent slopes. This deep, well drained, strongly sloping soil is on hillsides and toe slopes. The slope is smooth and convex. Individual areas are 10 to 50 acres or more.

Typically, the surface layer is reddish brown gravelly sandy loam to a depth of about 8 inches. The subsoil is yellowish red loam to a depth of 14 inches, red sandy clay loam to a depth of 24 inches, and red clay loam to a depth of 65 inches or more. In places, there are soils that are similar to the Allen soil, but they have a gravelly subsoil at a depth of more than 40 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Cane, Holston, Minvale, Nauvoo, and Wax soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Cane and Wax soils are dissimilar to the Allen soil, and their use and management are different. These dissimilar soils make up about 10 percent of the map unit.

The Allen soil primarily is used as woodland or pasture. In some areas, the soil is used for cultivated crops or as hayland.

This soil is poorly suited to cultivated crops. Suitability is limited by the slope and the small size of most areas of this soil. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion, but they are difficult to install.

This soil is suited to pasture and hay. Slope is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. The slope severely limits the use of this soil for sewage lagoon areas. This limitation is difficult to overcome. Permeability and slope are moderate limitations to use as septic tank absorption fields, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for most types of building site development. Low soil strength moderately limits the use of this soil for local roads and streets.

This Allen soil is in land capability subclass IVe and in woodland ordination group 3o.

CaB—Cane loam, 2 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on toe slopes and stream terraces. The slope is smooth and convex. Individual areas are 10 to 40 acres or more.

Typically, the surface layer is brown loam to a depth of about 5 inches. The subsoil is yellowish red loam to a depth of 25 inches. Below that, it is brittle and compact, mottled, gray, red, and brown sandy clay loam to a depth of about 62 inches or more. In places, there are soils that are similar to the Cane soil, but the upper part of the subsoil is yellowish brown, or the lower part of the subsoil is gravelly.

Important Soil Properties:

Permeability—Moderate in the upper part of the subsoil and slow in the lower part
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—20 to 35 inches
Water Table—A seasonal high water table is at a depth of 24 to 36 inches during winter and early in the spring
Flooding—None

Included in mapping are a few areas of Allen, Minvale, Tanyard, Townley, and Wax soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Allen, Minvale, Tanyard, and Townley soils are dissimilar to the Cane soil, and their use and management are different. These dissimilar soils make up about 10 percent of the map unit.

The Cane soil primarily is used for cultivated crops (fig. 5) or as pasture. In some areas, the soil is used as woodland or hayland.

This soil is suited to cultivated crops. Suitability is limited by the small size of most areas of this soil. Erosion is a moderate hazard. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to suited to building site development and to use for sanitary facilities. Wetness and permeability severely limit the use of this soil as septic tank absorption fields. These limitations are difficult to overcome. Wetness is a moderate limitation to use for other types of sanitary facilities, but this limitation can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. Wetness is a moderate limitation for use of the soil for most other types of building site development.

This Cane soil is in land capability subclass IIe and in woodland ordination group 3o.

CaD—Cane loam, 8 to 12 percent slopes. This deep, moderately well drained, strongly sloping soil is on colluvium fans and toe slopes. The slope is smooth and convex. Individual areas are 10 to 50 acres or more.

Typically, the surface layer is brown loam to a depth of about 5 inches. The subsoil is yellowish red loam to a depth of 25 inches. Below that, it is brittle and compact, mottled, gray, red, and brown sandy clay loam to a depth of about 62 inches or more. In places, there are soils that are similar to the Cane soil, but they have a loamy subsoil at a depth of 30 to 40 inches, or they have a red or yellowish red subsoil.

Important Soil Properties:

Permeability—Moderate in the upper part of the subsoil and slow in the lower part
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—20 to 35 inches
Water Table—A seasonal high water table is at a depth of 24 to 36 inches during winter and early in the spring
Flooding—None

Included in mapping are a few areas of Allen, Minvale, Tanyard, and Townley soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres. The included soils are dissimilar to the Cane soil, and their use and management are different.

The Cane soil primarily is used as woodland or pasture. In some areas, the soil is used for cultivated crops or hay.

This soil is suited to cultivated crops. Suitability is limited by the small size of most areas of this soil. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops

Figure 5.—Corn on Cane loam, 2 to 8 percent slopes, was harvested for silage.

reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. Slope is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development and to use for sanitary facilities. Wetness and permeability are severe limitations to use as septic tank absorption fields. These limitations are difficult to overcome. Wetness and slope moderately to severely limit the use of this soil for other types of sanitary facilities, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for most types of building site development. Wetness and slope are moderate to severe limitations for use of the soil for most other types of building site development.

This Cane soil is in land capability subclass IIIe and in woodland ordination group 3o.

ChA—Choccolocco silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on flood plains. The slope is smooth and slightly concave. Individual areas are 10 to 80 acres or more.

Typically, the surface layer is dark brown silt loam to a depth of about 6 inches. The subsoil is brown and dark yellowish brown silty clay loam to a depth of 56 inches. Below that, it is mottled, brown sandy clay loam to a depth of about 72 inches or more. In places, there are soils that are similar to the Choccolocco soil, but they have sandy clay loam in the upper part of the subsoil, or they have a red or yellowish red subsoil.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Strongly acid or medium acid
Organic Matter Content—Moderate
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—Occasionally flooded for very brief duration during winter and early in the spring

Included in mapping are a few areas of Holston, Mooreville, Tanyard, Toccoa, and Waynesboro soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Mooreville and Waynesboro soils are dissimilar to the Choccolocco soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

This Choccolocco soil primarily is used for cultivated crops. In some areas, the soil is used as woodland or as pasture.

This soil is well suited to cultivated crops; however, flooding is a hazard. Only crops that can adapt to occasional very brief periods of flooding should be planted. Returning crop residue to the soil helps maintain soil tilth.

This soil is well suited to pasture and hay. Deferred grazing during dry periods helps prevent soil compaction and helps keep the pasture and soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development. It also is poorly suited to use for sanitary facilities. Flooding is a severe limitation that is difficult to overcome.

This Choccoloco soil is in land capability subclass IIw and in woodland ordination group 3o.

CoB—Conasauga and Firestone silt loams, 1 to 8 percent slopes. The soils that make up this undifferentiated group are moderately deep on gently sloping uplands. Conasauga soil is moderately well drained, and Firestone soil is well drained. The slope is smooth and slightly convex to slightly concave. Individual areas are 40 to 2,000 acres or more.

Conasauga soil and soils that are similar make up about 50 percent of the map unit. Typically, the surface layer is brown silt loam to a depth of about 4 inches. The subsoil is strong brown silty clay to a depth of 16 inches. Below that, it is yellowish brown silty clay to a depth of 24 inches. The underlying material is weathered shale. In places, there are soils that are similar to the Conasauga soil, but weathered shale is at a depth of 40 to 50 inches.

Firestone soil and soils that are similar make up about 45 percent of the map unit. Typically, the surface layer is yellowish brown silt loam to a depth of about 3 inches. The next layer is light olive brown silt loam to a depth of about 6 inches. The subsoil is brownish yellow clay to a depth of 25 inches. Below that, it is brownish yellow silty clay to a depth of about 33 inches. The underlying material is weathered shale. In places, there are soils that are similar to the Firestone soil, but weathered shale is at a depth of 40 to 60 inches.

Important Soil Properties:

Permeability—Slow in the Conasauga and Firestone soils
Available Water Capacity—Low in Conasauga soil and medium in the Firestone soil
Soil Reaction—Extremely acid to medium acid in Conasauga soil and very strongly acid or strongly acid in the Firestone soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Shrink-Swell Potential—High
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Gaylesville, Tanyard, and Wax soils. The included soils are dissimilar to the Conasauga and Firestone soils, and their use and management are different. The included soils make up about 5 percent of the map unit, but individual areas generally are 100 feet or less in width and less than 5 acres.

The Conasauga and Firestone soils primarily are used as woodland. In some areas, these soils have been cleared and are used for cultivated crops or as pasture.

These soils are poorly suited to cultivated crops. The slope and the low to medium available water capacity are limitations for this use. These limitations and the moderate hazard of erosion are a concern for management of the soils. If these soils are cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. These soils have only fair tilth and can only be worked within a narrow range of moisture content.

These soils are suited to pasture and hay. Soil compaction and plant damage can be reduced by delaying forage cutting operations and deferring grazing during wet periods.

Coniferous trees are suited to these soils. Loblolly pine is a recommended tree to plant, but the potential productivity is low. There is a moderate limitation for the use of equipment on Conasauga and Firestone soils. The moderate hazard of erosion on Conasauga soil is a concern for management.

These soils are poorly suited to building site development and to use for roads and streets and for most types of sanitary facilities. Depth to bedrock, permeability, shrinking and swelling, and low soil strength are severe limitations. These limitations are difficult to overcome.

The Conasauga and Firestone soils are in land capability subclass IIIe and in woodland ordination group 4c.

DeB—Dewey loam, 2 to 8 percent slopes. This deep, well drained, gently sloping soil is on ridges and hillsides. The slope is smooth and convex. Individual areas are 5 to 200 acres or more.

Typically, the surface layer is brown loam to a depth of about 4 inches. The subsoil is red clay loam to a depth of 7 inches. Below that, it is red clay to a depth of 65 inches or more. In places, there are soils that are similar to the Dewey soil, but they have a dark red subsoil.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Emory, Minvale, Wax, and Waynesboro soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Emory and Wax soils are dissimilar to the Dewey soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Dewey soil is primarily used for cultivated crops or as pasture. In some areas, the soil is used as woodland or hayland.

This soil is suited to cultivated crops (fig. 6). Suitability is limited by the small size of most areas of this soil. Erosion is a moderate hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

The Dewey soil is well suited to pasture or hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. Seepage moderately limits the use of this soil for sewage lagoon areas. Permeability moderately limits the use of this soil as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. Low soil strength and shrinking and swelling of the soil are moderate to severe limitations for use for most other types of building site development.

This Dewey soil is in land capability subclass IIe and in woodland ordination group 3o.

DeD—Dewey loam, 8 to 15 percent slopes. This deep, well drained, strongly sloping soil is on ridges and hillsides. The slope is smooth and convex. Individual areas are 5 to 200 acres or more.

Typically, the surface layer is brown loam to a depth of about 4 inches. The subsoil is red silty clay loam to a depth of 7 inches, dark red clay to a depth of 23 inches, and red clay to a depth of 65 inches or more. In places, there are soils that are similar to the Dewey soil, but the lower part of the subsoil is clay loam.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Emory, Minvale, Wax, and Waynesboro soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres. Emory and Wax soils are dissimilar to the Dewey soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Dewey soil primarily is used as woodland or pasture. In some areas, the soil is used for cultivated crops or hay.

This soil is suited to cultivated crops. Suitability is limited by the slope and the small size of most areas of this soil. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil if cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control

Figure 6.—Soybeans growing on Dewey loam, 2 to 8 percent slopes. This soil is suited to most cultivated crops.

erosion. Terraces also help to control erosion, but they are difficult to install.

This soil is suited to pasture and hay. The slope is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to suited to building site development and to use for sanitary facilities. The slope severely limits the use of this soil for sewage lagoon areas. This limitation is difficult to overcome. Slope and permeability are moderate limitations to use as septic tank absorption fields, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Slope, low soil strength, and shrinking and swelling of the soil are moderate to severe limitations for use for most other types of building site development.

This Dewey soil is in land capability subclass IVe and in woodland ordination group 3o.

DwC3—Dewey silty clay loam, 4 to 12 percent slopes, severely eroded. This deep, well drained, gently sloping to strongly sloping soil is on ridges and hillsides. The slope is smooth and convex. Individual areas are 10 to 100 acres.

Typically, the surface layer is dark red silty clay loam to a depth of about 6 inches. The subsoil is red clay to a depth of 60 inches or more. In places, there are soils that are similar to the Dewey soil, but the lower part of the subsoil is cherty.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low

Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Emory, Minvale, and Waynesboro soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Emory soils are dissimilar to the Dewey soil, and their use and management are different. These dissimilar soils make up less than 5 percent of the map unit.

The Dewey soil primarily is used for cultivated crops or sod production. In some areas, the soil is used as pasture or hayland.

This soil is poorly suited to cultivated crops. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help control erosion. In many areas, there are shallow gullies and rills. Land shaping is needed on these areas before a seedbed can be prepared.

This soil is suited to pasture and hay. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited to this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and soil in good condition. Low natural fertility is a limitation for the use of this soil for pasture and hay. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine is a recommended tree to plant. Erosion is a moderate hazard on this soil; and because of past erosion, there is a moderate limitation for use of equipment on this soil. The rate of seedling mortality is moderate. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to suited to building site development and to use for sanitary facilities. Slope severely limits the use of this soil for sewage lagoon areas. This limitation is difficult to overcome. Permeability and slope are moderate limitations to use as septic tank absorption fields, but these limitations can be overcome by proper design. Because this soil is gently sloping to strongly sloping, cut and fill material is needed for site preparation for small commercial buildilngs. Slope, low soil strength, and shrinking and swelling of the soil are moderate to severe limitations for use for most other types of building site development.

This Dewey soil is in land capability subclass IVe and in woodland ordination group 4c.

EmA—Emory silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is in upland depressions and drainageways. The slope is smooth and concave. Individual areas are 4 to 10 acres.

Typically, the surface layer is dark reddish brown silt loam to a depth of about 11 inches. The subsoil is reddish brown silty clay loam to a depth of 29 inches. The buried surface layer is dark reddish brown silt loam to a depth of 39 inches. The buried subsoil is dark red silty clay loam to a depth of 65 inches. In places, there are soils that are similar to the Emory soil, but the thickness of the recent alluvium is 10 to 20 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—High
Soil Reaction—Strongly acid or medium acid
Organic Matter Content—Moderate
Natural Fertility—Moderate
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—A perched seasonal high water table is above the surface layer for a few days after heavy rainfall during winter and early in the spring
Flooding—None; this soil is subject to ponding

Included in mapping are a few areas of Dewey and Mooreville soils. Dewey and Mooreville soils are dissimilar to the Emory soil, and their use and management are different. These dissimilar soils make up about 10 percent of the map unit, but individual areas generally are less than 2 acres.

The Emory soil primarily is used for cultivated crops. In some areas, the soil is used as woodland, pasture, or hayland.

This soil is well suited to cultivated crops. Erosion is a slight hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, subsurface drainage or surface drainage is needed to prevent crop damage in most areas. Generally, conservation tillage is not needed to control soil loss by erosion, but it works well on Emory soil in conjunction with the adjacent, more sloping areas that need to reduce soil loss.

This soil is well suited to pasture and hay. There are no significant limitations for the use of this soil for commonly grown pasture and hay crops. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development and to use for sanitary facilities. Ponding severely limits

the use of this soil for sanitary facilities. This limitation is difficult to overcome. Ponding is a moderate to severe limitation for use of the soil for building site development.

This Emory soil is in land capability subclass IIw and in woodland ordination group 2o.

FcD—Firestone and Conasauga silt loams, 8 to 15 percent slopes. The soils that make up this undifferentiated group are moderately deep and strongly sloping on uplands. Firestone soil is well drained, and Conasauga soil is moderately well drained. The slope is smooth and convex. Individual areas are long and narrow and range from 10 to 45 acres.

Firestone soil and soils that are similar make up about 45 percent of the map unit. Typically, the surface layer is brown silt loam to a depth of about 4 inches. The subsoil is yellowish red clay to a depth of 38 inches. The underlying material is weathered shale. In places, there are soils that are similar to the Firestone soil, but weathered shale is at a depth of 40 to 60 inches.

Conasauga soil and soils that are similar make up about 40 percent of the map unit. Typically the surface layer is silt loam to a depth of about 3 inches. The subsoil is strong brown silty clay to a depth of 13 inches. Below that, it is yellowish brown silty clay to a depth of about 27 inches. The underlying material is weathered shale. In places, there are soils that are similar to the Conasauga soil, but weathered shale is at a depth of 40 to 50 inches.

Important Soil Properties:

Permeability—Slow in Firestone and Conasauga soils
Available Water Capacity—Medium in Firestone soil and low in Conasauga soil
Soil Reaction—Very strongly acid or strongly acid in Firestone soil and extremely acid to medium acid in Conasauga soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Shrink-Swell Potential—High
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Minvale soils. Also included are Gaylesville, Tanyard, and Wax soils. These soils are occasionally to frequently flooded for brief periods during winter and early in the spring. They generally are shown by either a perennial or an intermittent stream symbol. The included soils are dissimilar to the Firestone and Conasauga soils, and their use and management are different. The included soils make up about 5 percent of the map unit, but individual areas generally are less than 100 feet in width and less than 5 acres.

The Firestone and Conasauga soils primarily are used as woodland. In some small areas, these soils have been cleared and are used for cultivated crops or as pasture.

These soils are not suited to cultivated crops. The slope and low to medium available water capacity are limitations for the use of the soil for cultivated crops. Erosion is a severe hazard. These soils have only fair tilth and can only be worked within a narrow range of moisture content. In areas where water concentrates, these soils are also subject to gully erosion.

These soils are poorly suited to pasture and hay. The slope and the low to medium available water capacity are limitations. The hazard of erosion is severe. Soil compaction and plant damage can be reduced by delaying forage cutting operations and deferring grazing during wet periods.

Coniferous trees are suited to these soils. The potential productivity is low. Loblolly pine is a recommended tree to plant. There is a moderate limitation for the use of equipment on these soils. Erosion is a moderate hazard.

These soils are poorly suited to building site development and to use for most types of sanitary facilities. Depth to bedrock, permeability, shrinking and swelling, and low soil strength are severe limitations. These limitations are difficult to overcome.

The Conasauga and Firestone soils are in land capability subclass VIe and in woodland ordination group 4c.

GaA—Gaylesville silt loam, 0 to 2 percent slopes. This deep, poorly drained or somewhat poorly drained, nearly level soil is on flood plains. The slope is smooth and slightly convex. Individual areas are 10 to 150 acres.

Typically, the surface layer is very dark grayish brown loam to a depth of about 5 inches. The subsoil is grayish brown silty clay loam to a depth of 11 inches, and it is gray clay to a depth of 60 inches or more. In places, there are soils that are similar to the Gaylesville soil, but they have a subsoil that is loamy.

Important Soil Properties:

Permeability—Slow
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—A seasonal high water table is within a depth of 18 inches during winter and early in the spring
Flooding—Frequently flooded for brief duration during winter and early in the spring

Included in mapping are a few areas of Conasauga and Tanyard soils. Conasauga and Tanyard soils are dissimilar to the Gaylesville soil, and their use and

management are different. These dissimilar soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres.

The Gaylesville soil primarily is used as woodland. In some areas, the soil is used as pasture or hayland.

This soil is poorly suited to cultivated crops. Wetness and flooding are severe limitations. Erosion is a slight hazard. Only crops that can adapt to excessive wetness should be planted.

This soil is suited to poorly suited to pasture and hay. Wetness and flooding are moderate to severe limitations. Only grasses that can adapt to flooding and wetness should be planted on this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Fertilizing and harvesting are restricted during wet periods.

Coniferous and deciduous trees are suited to this soil. The potential productivity is moderate. Loblolly pine, sweetgum, and water oak are the recommended trees to plant. Wetness and flooding moderately limit the use of equipment on this soil. The rate of seedling mortality is moderate. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is not suited to building site development or to use for sanitary facilities. Wetness and flooding are severe limitations that are difficult to overcome.

This Gaylesville soil is in land capability subclass IVw and in woodland ordination group 3w.

HoB—Holston sandy loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on stream terraces. The slope is smooth and is either slightly concave or slightly convex. Individual areas are 10 to 50 acres.

Typically, the surface layer is brown sandy loam to a depth of about 7 inches. The subsoil is yellowish brown loam to a depth of 17 inches, yellowish brown clay loam to a depth of 38 inches, and yellowish red clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Holston soil, but they are moderately well drained.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Choccolocco, Wax, and Waynesboro soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres. Wax soils are dissimilar to the Holston soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Holston soil primarily is used for cultivated crops. In some areas, the soil is used as woodland, pasture, or hayland.

This soil is well suited to cultivated crops. Erosion is a moderate hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is well suited to building site development and to use for sanitary facilities. Seepage is a moderate limitation for sewage lagoon areas. Permeability moderately limits the use of this soil as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping to sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. There are no significant concerns in management for use of this soil for other building site development.

This Holston soil is in land capability subclass IIe and in woodland ordination group 3o.

LoA—Lobelville cherty silt loam, 0 to 2 percent slopes. This deep, moderately well drained, nearly level soil is on flood plains. Individual areas are 10 to 30 acres or more.

Typically, the surface layer is dark grayish brown cherty silt loam to a depth of about 4 inches. The subsoil is brown cherty loam to a depth of 14 inches. Below that, it is mottled, brown and gray cherty clay loam to a depth of about 55 inches. The underlying material to a depth of 60 inches or more is gray very cherty loam.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Low
Soil Reaction—Very strongly acid to medium acid
Organic Matter Content—Moderate
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches

Water Table—A seasonal high water table is at a depth of 24 to 36 inches during winter and early in the spring
Flooding—Frequently flooded for very brief duration during winter and early in the spring

Included in mapping are a few areas of Dewey, Minvale, Mooreville, and Wax soils. The included soils make up about 30 percent of the map unit, but individual areas generally are less than 5 acres. Dewey and Minvale soils are dissimilar to the Lobelville soil, and their use and management are different. These dissimilar soils make up about 10 percent of the map unit.

The Lobelville soil primarily is used as woodland. In some areas, the soil is used for cultivated crops or as pasture or hayland.

This soil is poorly suited to suited to cultivated crops. Wetness and flooding are severe limitations. Drainage is needed to help lower the high water table and to remove runoff from adjacent uplands. Returning crop residue to the soil helps maintain soil tilth. Wetness and flooding also delay seedbed preparation. Only crops that can adapt to excessive wetness and flooding should be planted on this soil.

This soil is suited to pasture and hay. Wetness and flooding moderately limit the use of this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Fertilizing and harvesting are restricted during wet periods.

Coniferous and deciduous trees are suited to this soil. The potential productivity is moderate. Loblolly pine, yellow-poplar, sweetgum, and water oak are the recommended trees to plant. Wetness and flooding moderately limit the use of equipment on this soil. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is not suited to building site development. It also is not suited to use for sanitary facilities. Wetness and flooding are severe limitations that are difficult to overcome.

This Lobelville soil is in land capability subclass IIIw and in woodland ordination group 2w.

McB—Minvale cherty loam, 2 to 8 percent slopes. This deep, well drained, gently sloping soil is on hillsides, benches, and toe slopes. The slope is smooth and convex. Individual areas are 5 to 50 acres or more.

Typically, the surface layer is brown cherty loam to a depth of about 4 inches. The next layer is yellowish brown cherty loam to a depth of about 9 inches. The subsoil is strong brown cherty silty clay loam to a depth of 16 inches. Below that, it is yellowish red cherty silty clay loam to a depth of 65 inches or more. In places, there are soils that are similar to the Minvale soil, but they have a very cherty subsoil below a depth of about 40 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Allen, Bodine, Cane, Dewey, Mooreville, Nella, and Townley soils. The included soils make up about 25 percent of the map unit, but individual areas generally are less than 5 acres. Bodine, Cane, Mooreville, and Townley soils are dissimilar to the Minvale soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Minvale soil primarily is used for cultivated crops or as pasture. In some areas, the soil is used as woodland or hayland.

This soil is suited to cultivated crops. Suitability is limited by the small size of most areas of this soil. Erosion is a moderate hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. Seepage and slope moderately limit the use of this soil for sewage lagoon areas. Permeability moderately limits the use of this soil as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. There are no significant concerns in management for use of this soil for dwellings with or without basements. Low soil strength moderately limits the use of this soil for local roads and streets.

This Minvale soil is in land capability subclass IIe and in woodland ordination group 3o.

McD—Minvale cherty loam, 8 to 15 percent slopes. This deep, well drained, strongly sloping soil is on ridges, hillsides, and toe slopes. The slope is complex and convex. Individual areas are 10 to 200 acres or more.

Typically, the surface layer is brown cherty loam to a depth of about 4 inches. The subsoil is yellowish brown cherty loam to a depth of about 9 inches; strong brown and yellowish red cherty silty clay loam to a depth of about 24 inches; and mottled, yellowish red cherty silty clay loam to a depth of 65 inches or more (fig. 7). In places, there are soils that are similar to the Minvale soil, but they have a very cherty subsoil at a depth of more than 40 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Allen, Bodine, Cane, Dewey, Mooreville, Nella, and Townley soils. The included soils make up about 25 percent of the map unit, but individual areas generally are less than 5 acres. Allen, Bodine, Cane, Mooreville, and Townley soils are dissimilar to the Minvale soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Minvale soil primarily is used as woodland or pasture. In some areas, it is used for crops and hay.

This soil is poorly suited to cultivated crops. Suitability is limited by the slope and small size of most areas of this soil. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to

Figure 7.—Road cut in Minvale cherty loam, 8 to 15 percent slopes. The subsoil is more than 15 percent chert fragments.

the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops help reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. Slope is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil; the potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to suited to building site development. It also is poorly suited to suited to use for sanitary facilities. The slope is a severe limitation for sewage lagoon areas. This limitation is difficult to overcome. Permeability and slope are moderate limitations to use as septic tank absorption fields, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for most building site development. Low soil strength moderately limits the use of this soil for local roads and streets.

This Minvale soil is in land capability subclass IVe and in woodland ordination group 3o.

MdF—Minvale-Dewey complex, 15 to 30 percent slopes. This complex consists of deep, moderately steep, well drained Minvale and Dewey soils on side slopes and upland ridges. The slope is complex and concave. Individual areas range from 25 to 300 acres or more. The Minvale and Dewey soils are in areas that are so small and form such an intricate pattern that it was not practical to map them separately.

Minvale soil and soils that are similar make up about 62 percent of the map unit. Typically, the surface layer is brown cherty loam to a depth of about 6 inches. The subsoil is yellowish brown and strong brown cherty silty clay loam to a depth of 18 inches. Below that, it is yellowish red cherty silty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Minvale soil, but they have a very cherty subsoil at a depth of more than 40 inches.

Dewey soil and soils that are similar make up about 30 percent of the map unit. Typically, the surface layer is dark reddish brown silt loam to a depth of about 7 inches. The subsoil is red clay loam to a depth of 14 inches. Below that, it is red clay to a depth of 60 inches or more. In places, there are soils that are similar to the Dewey soil, but they have a cherty subsoil at a depth of more than 40 inches.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low in Minvale soil and moderately low in the Dewey soil
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are small areas of Bodine soils. Also included are areas of Lobelville and Wax soils that are occasionally or frequently flooded for brief periods throughout the year. These soils generally are shown by either a perennial or an intermittent stream symbol. The included soils are dissimilar to Minvale and Dewey soils, and their use and management are different. The included soils make up about 8 percent of the map unit, but individual areas generally are less than 5 acres.

The Minvale and Dewey soils primarily are used as woodland. In some small areas, the Dewey soil has been cleared and is used as pasture.

These soils are not suited to cultivated crops. Slope is a severe limitation, and erosion is a severe hazard if the soil is cultivated. In areas where water concentrates, these soils are subject to gully erosion.

These soils are poorly suited to pasture and hay. Slope is a severe limitation, and erosion is a severe hazard if the soil is plowed.

Coniferous trees are suited to these soils. Loblolly pine and yellow-poplar are the recommended trees to plant; the potential productivity is moderate. There is a moderate limitation for the use of equipment on Minvale and Dewey soils. The hazard of erosion on these soils is moderate. These are significant concerns in management when considering mechanical planting and harvesting.

These soils are poorly suited to building site development and to use for most types of sanitary facilities. The slope is a severe limitation. This limitation is difficult to overcome.

The Minvale and Dewey soils are in land capability subclass VIe and in woodland ordination group 3r.

MEB—Minvale-Bodine association, steep. This map unit consists of deep, well drained soils on a long, narrow ridge that forms a mountain. This mountain ridge is in a northeast to southwest orientation and covers about 12,000 acres. These soils are cherty and are in a regular and repeating pattern. The slope ranges from about 15 to 40 percent.

Minvale soil and soils that are similar are on the lower two-thirds of the southeast slopes and the northwest slopes. These soils make up about 69 percent of the map unit. Typically, the surface layer is brown cherty loam to a depth of about 5 inches. The next layer is yellowish brown cherty loam to a depth of about 12 inches. The subsoil is strong brown cherty silty clay loam to a depth of 16 inches. Below that, it is yellowish red

cherty silty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Minvale soil, but they have a very cherty subsoil at a depth of more than 40 inches.

Bodine soil and soils that are similar are on the upper one-third of the southeast slopes. These soils make up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown cherty loam to a depth of about 6 inches. The subsoil is brown very cherty loam to a depth of 12 inches, dark brown very cherty loam to a depth of 17 inches, and strong brown very cherty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Bodine soil, but the subsoil extends to a depth of 50 to 60 inches.

Important Soil Properties:

Permeability—Moderate in the Minvale soil and moderately rapid in the Bodine soils
Available Water Capacity—Medium in Minvale soil and low in the Bodine soil
Soil Reaction—Very strongly acid or strongly acid in Minvale soil and extremely acid to strongly acid in the Bodine soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are the Townley soils on the lower one-fourth of both sides of the ridge. Also included are minor areas of soils that are shallow to sandstone bedrock on the narrow ridgetops. In some areas, there are sandstone bedrock outcrops on the narrow ridgetops.

In most areas, these soils are used mainly as woodland. In some areas near Leeds, the soils are in low density residential use.

These soils are not suited to cultivated crops or to pasture and hay crops because of the steep slopes, the hazard of erosion, and the rock outcrops and fragments on the surface layer. In some areas, the included soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to these soils. Loblolly pine and yellow-poplar are the recommended trees to plant on Minvale soil; the potential productivity is moderate. Loblolly pine is the recommended tree to plant on Bodine soil; the potential productivity is low. There is a moderate limitation for the use of equipment on Minvale and Bodine soils. Also, the hazard of erosion on these soils is moderate. The rate of seedling mortality is severe on the Bodine soil.

The soils of this association are not suited to building site development or to use for sanitary facilities because of the steep slope.

This Minvale soil is in land capability subclass VIIe and in woodland ordination group 3r. The Bodine soil is in land capability subclass VIIs and in woodland ordination group 4f.

MNB—Minvale-Nella-Bodine association, steep. This map unit consists of deep, well drained soils on a long, narrow ridge that has been cut in several places by geological erosion to form a chain-like mountain. This mountain ridge is in a northeast to southwest orientation. The soils are cherty and gravelly and are in a regular and repeating pattern. The slope ranges from about 20 to 45 percent. Individual areas are 40 to 400 acres or more.

Minvale soil and soils that are similar are on the southeast slopes and the upper one-third of the northwest slopes. These soils make up about 34 percent of the map unit. Typically, the surface layer is dark grayish brown cherty loam to a depth of about 4 inches. The next layer is dark brown cherty loam to a depth of about 8 inches. The subsoil is strong brown cherty silty clay loam to a depth of 30 inches and yellowish red cherty silty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Minvale soil, but they have a very cherty or extremely cherty subsoil at a depth of more than 40 inches.

Nella soil and soils that are similar are on the lower two-thirds of the northwest slopes. These soils make up about 24 percent of the map unit. Typically, the surface layer is brown gravelly sandy loam to a depth of about 3 inches. The subsoil is strong brown gravelly loam to a depth of 10 inches, strong brown gravelly clay loam to a depth of 14 inches, and yellowish red gravelly clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Nella soil, but they have a very gravelly subsoil below a depth of 40 inches.

Bodine soil and soils that are similar are on the southeast slopes and the upper one-third of the northwest slopes. These soils make up about 21 percent of the map unit. Typically, the surface layer is dark grayish brown cherty loam to a depth of about 6 inches. The subsoil is brown very cherty loam to a depth of 12 inches, dark brown very cherty loam to a depth of 17 inches, and strong brown very cherty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Bodine soil, but the subsoil extends to a depth of 50 to 60 inches.

Important Soil Properties:

Permeability—Moderate in Minvale and Nella soils and moderately rapid in the Bodine soil
Available Water Capacity—Medium in Minvale soil and low in the Nella and Bodine soils
Soil Reaction—Very strongly acid or strongly acid in the Minvale and Nella soils and extremely acid to strongly acid in the Bodine soil
Organic Matter Content—Low

Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are Townley soils on the lower one-fourth of both sides of the ridge. Also included are minor areas of soils that are shallow to sandstone bedrock on the narrow ridgetops. In some areas, there are sandstone bedrock outcrops on the narrow ridgetops; and in some areas, limestone bedrock outcrops are on the lower one-fourth of the northwest slopes.

In most areas, these soils are used mainly as woodland. In some areas near Pell City, these soils are in low density residential use.

These soils are not suited to cultivated crops or to pasture and hay crops because of the steep slopes, the hazard of erosion, and the rock outcrops and fragments on the surface layer. In some areas, the minor soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to these soils. Loblolly pine and yellow-poplar are the recommended trees to plant on Minvale and Nella soils; the potential productivity is moderate. Loblolly pine is the recommended tree to plant on Bodine soil; the potential productivity is low. There is a moderate limitation for the use of equipment on Minvale and Bodine soils. Also, the hazard of erosion on these soils is moderate. The rate of seedling mortality is severe on the Bodine soil.

Because of the steep slope, the soils of this association are not suited to building site development or to use for sanitary facilities.

The Minvale and Nella soils are in land capability subclass VIIe. Minvale soil is in woodland ordination group 3r, and Nella soil is in group 3x. The Bodine soil is in land capability subclass VIIs and in woodland ordination group 4f.

MNT—Minvale-Nella-Townley association, steep. This map unit consists of deep to moderately deep, well drained soils on three long, narrow ridges that have been cut or partially cut in several places by geological erosion and on a short ridge in the Greasy Cove area. These mountain ridges are in a northeast to southwest orientation. The soils are cherty, gravelly, and clayey and are in a regular and repeating pattern. The slope ranges from about 20 to 45 percent. Individual areas are about 400 to 1,000 acres or more.

Minvale soil and soils that are similar are on the lower one-third of the southeast slopes and the northwest slopes. These soils make up about 34 percent of the map unit. Typically, the surface layer is brown cherty loam to a depth of about 3 inches. The next layer is yellowish brown cherty silt loam to a depth of about 7 inches. The subsoil is yellowish brown cherty silty clay loam to a depth of 14 inches; strong brown cherty silty clay loam to a depth of 22 inches; and yellowish red cherty silty clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Minvale soil, but the subsoil is very cherty or extremely cherty at a depth of more than 40 inches.

Nella soil and soils that are similar are on the middle one-third of the northwest slopes and the southeast slopes. These soils make up about 27 percent of the map unit. Typically, the surface layer is dark yellowish brown gravelly sandy loam to a depth of about 4 inches. The subsoil is strong brown gravelly loam to a depth of 10 inches and yellowish red gravelly clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Nella soil, but the subsoil is very gravelly below a depth of 40 inches.

Townley soil and soils that are similar are on narrow ridges and on the upper one-third of the southeast slopes and the northwest slopes. These soils make up about 15 percent of the map unit. Typically, the surface layer is brown silt loam to a depth of about 4 inches. The subsoil is strong brown silty clay loam to a depth of 12 inches and yellowish red clay to a depth of about 30 inches. Below this, to a depth of 60 inches, is weathered shale bedrock. In places, there are soils that are similar to Townley soil, but the subsoil extends to a depth of about 50 inches.

Important Soil Properties:

Permeability—Moderate in Minvale and Nella soils and slow in the Townley soil
Available Water Capacity—Medium in Minvale soil and low in the Nella and Townley soils
Soil Reaction—Very strongly acid or strongly acid in Minvale and Nella soils and extremely acid to strongly acid in the Townley soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches in the Minvale and Nella soils and 20 to 40 inches in the Townley soil
Root Zone—More than 60 inches in the Minvale and Nella soils and 20 to 40 inches in the Townley soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are minor areas of soils that are shallow to sandstone bedrock. These soils are on the upper one-fourth of both sides of the ridge. In some areas, there is sandstone bedrock outcrop on the narrow ridgetops, and in some areas, limestone bedrock outcrop is on the lower one-fourth of the southeast slopes and the northwest slopes.

In most areas, these soils are used mainly as woodland. In some areas in the northwest part of the county, the soils are used as pasture.

These soils are not suited to cultivated crops or to pasture and hay crops because of the steep slopes, the hazard of erosion, and the rock outcrops and fragments on the surface layer. In some areas, the included soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to these soils. Loblolly pine and yellow-poplar are the recommended trees to plant on Minvale and Nella soils. The potential productivity of the Minvale and Nella soils is moderate. Loblolly pine is the recommended tree to plant on the Townley soil. The potential productivity of the Townley soil is low. There is a moderate to severe limitation for the use of equipment on the Minvale, Nella, and Townley soils. Also, the hazard of erosion is moderate to severe on these soils.

Because of the steep slopes, the soils of this association are not suited to building site development or to use for sanitary facilities.

These Minvale, Nella, and Townley soils are in land capability subclass VIIe. Minvale soil is in woodland ordination group 3r. Nella soil is in woodland ordination group 3x. Townley soil is in woodland ordination group 4r.

MvA—Mooreville silt loam, 0 to 2 percent slopes. This deep, moderately well drained, nearly level soil is on flood plains. The slope is smooth and slightly concave. Individual areas are 10 to 50 acres or more.

Typically, the surface layer is dark grayish brown silt loam to a depth of about 5 inches. The subsoil is brown silty clay loam to a depth of 11 inches; mottled, grayish brown, dark yellowish brown, and brown silty clay loam to a depth of 24 inches; mottled, grayish brown silty clay loam to a depth of 47 inches; and mottled, yellow, light brownish gray, and grayish brown clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Mooreville soil, but they have a silty subsoil.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Strongly acid or very strongly acid
Organic Matter Content—Moderate
Natural Fertility—Medium
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—A seasonal high water table is at a depth of 18 to 36 inches during winter and early in the spring
Flooding—Frequently flooded for brief duration during winter and early in the spring

Included in mapping are a few areas of Choccolocco, Lobelville, and Wax soils. Also included are soils that have 10 to 20 inches of recent alluvium. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Choccolocco and Wax soils are dissimilar to the Mooreville soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Mooreville soil primarily is used as woodland. In some areas, the soil is used for cultivated crops or as pasture.

This soil is poorly suited to suited to cultivated crops. Wetness and flooding are severe limitations. Returning crop residue to the soil helps maintain soil tilth. Drainage is needed to lower the high water table and to remove runoff from adjacent uplands. Wetness and flooding also delay seedbed preparation. Only crops that can adapt to excessive wetness should be planted.

This soil is suited to pasture and hay. Wetness and flooding are moderate limitations. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and soil in good condition. Fertilizing and harvesting during wet periods are restricted.

Coniferous and deciduous trees are suited to this soil; the potential productivity is high. Loblolly pine, American sycamore, yellow-poplar, sweetgum, cherrybark oak, and green ash are recommended trees to plant. Flooding and wetness severely limit the use of equipment on this soil. The rate of seedling mortality is severe. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is not suited to building site development and to use for sanitary facilities. Wetness and flooding are severe limitations that are difficult to overcome.

This Mooreville soil is in land capability subclass Vw and in woodland ordination group 1w.

NaB—Nauvoo sandy loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on the upland plateaus, ridges, and benches of the Chandler and Blount Mountains. The slope is smooth and convex and vary in length from 40 to 120 feet. Individual areas are 5 to 50 acres.

Typically, the surface layer is yellowish brown sandy loam to a depth of about 7 inches. The upper part of the subsoil is yellowish red sandy clay loam to a depth of 35 inches. The lower part is yellowish red sandy loam to a depth of 41 inches. Below that is weathered sandstone bedrock to a depth of 60 inches or more. In places, there are soils that are similar to the Nauvoo soil; but they have weathered sandstone bedrock at a depth of 30 to 40 inches, or a yellowish brown subsoil, or a dark red subsoil more than 60 inches thick.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid to medium acid
Organic Matter Content—Moderately low
Natural Fertility—Low

Figure 8.—Cucumbers are one of the many truck crops well suited to Nauvoo sandy loam, 2 to 6 percent slopes.

Depth to Bedrock—40 to 60 inches
Root Zone—40 to 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Allen, Nella, and Townley soils. Also included are areas of soils that have sandstone bedrock at a depth of less than 30 inches. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Nella and Townley soils are dissimilar to the Nauvoo soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Nauvoo soil primarily is used for cultivated crops and truck crops (fig. 8). In some areas, the soil is used as woodland, pasture, or hayland.

This soil is well suited to cultivated crops and to truck crops. Erosion is a moderate hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. Depth to bedrock and seepage moderately limit the use of this soil for sewage lagoon areas. Depth to bedrock and permeability are moderate limitations to use as septic tank absorption fields, but

these limitations can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. These are no significant concerns in management for use of this soil for other types of building site development.

This Nauvoo soil is in land capability subclass IIe and in woodland ordination group 2o.

NaD—Nauvoo sandy loam, 6 to 15 percent slopes. This deep, well drained, strongly sloping soil is on the upland plateaus and hillsides of the Chandler and Blount Mountains. The slope is complex and convex. Individual areas are 15 to 200 acres or more.

Typically, the surface layer is yellowish brown sandy loam to a depth of about 6 inches. The subsoil is sandy clay loam and sandy loam. It is strong brown to a depth of 9 inches, yellowish red to a depth of 20 inches, and red to a depth of 46 inches. Below that is weathered sandstone bedrock to a depth of 60 inches or more. In places, there are soils that are similar to the Nauvoo soil, but they have weathered sandstone bedrock at a depth of 30 to 40 inches, or they have a yellowish brown subsoil or a dark red subsoil more than 60 inches thick.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid to medium acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—40 to 60 inches
Root Zone—40 to 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Allen, Nella, and Townley soils. Also included are some areas that have sandstone bedrock at a depth of less than 30 inches. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Nella and Townley soils are dissimilar to the Nauvoo soil, and their use and management are different. These dissimilar soils make up about 10 percent of the map unit.

The Nauvoo soil primarily is used for cultivated crops or truck crops, as hayland, or as pasture. In some areas, the soil is used as woodland.

This soil is poorly suited to cultivated crops and to truck crops. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to severe gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming (fig. 9), stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. Depth to bedrock, permeability, and slope are moderate limitations for use as septic tank absorption fields. Slope is a moderate to severe limitation for use of the soil for other types of sanitary facilities, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Slope is a moderate limitation for use of this soil for other types of building site development.

This Nauvoo soil is in land capability subclass IVe and in woodland ordination group 2o.

NbD—Nauvoo-Rock outcrop complex, 2 to 15 percent slopes. This complex consists of deep, strongly sloping, well drained soil and areas of exposed sandstone bedrock on the upland plateaus and hillsides of the Chandler and Blount Mountains. The slope is complex and concave. Rock outcrops are bluff-type escarpments. Individual areas are 10 to 100 acres. The Nauvoo soil and Rock outcrop are in areas that are so small and intricately mixed that it was not practical to map them separately.

Nauvoo soil and soils that are similar make up about 52 percent of the map unit. Typically, the surface layer is brown loam to a depth of about 4 inches. The subsoil is sandy clay loam. The upper part of the subsoil is brown to a depth of 17 inches, and the lower part is yellowish red to a depth of 40 inches. Below that is weathered sandstone bedrock to a depth of 60 inches or more. In places, there are soils that are similar to the Nauvoo soil, but they have bedrock at a depth of 30 to 40 inches.

Rock outcrop and exposures that are similar make up about 27 percent of the map unit. These areas consist of exposed masses of hard sandstone bedrock that range up to several acres. Rock outcrops generally do not project more than 10 feet above the ground level. In some areas, there are similar exposures of stone-size to boulder-size sandstone rock that are essentially bare of soil material and vegetation.

Important Soil Properties:

Permeability—Moderate in Nauvoo soil
Available Water Capacity—Medium in Nauvoo soil
Soil Reaction—Very strongly acid to medium acid
Organic Matter Content—Moderately low in Nauvoo soil
Natural Fertility—Low in Nauvoo soil
Depth to Bedrock—40 to 60 inches in Nauvoo soil

Figure 9.—To reduce runoff and help control erosion, tomatoes are planted on the contour on Nauvoo sandy loam, 6 to 15 percent slopes.

Root Zone—40 to 60 inches in Nauvoo soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are some areas of Townley soils and of soils that are shallow to hard sandstone bedrock. Also included are soils that are poorly drained to very poorly drained. These soils are frequently flooded for long periods throughout the year and generally are shown by either a perennial or an intermittent stream symbol. The included soils are dissimilar to the Nauvoo soil, and their use and management are different. The included soils make up about 20 percent of the map unit, but individual areas generally are 100 feet or less in width and less than 5 acres.

This complex primarily is used as woodland. In some small areas, the Nauvoo soil has been cleared and is used as pasture. Many areas of this complex are used for Streamside Management Zones. These zones help maintain the water quality.

This complex is not suited to cultivated crops. The slope and exposed sandstone bedrock severely limit this use. There is a severe hazard of erosion on Nauvoo soil, and in areas where water concentrates, this soil is subject to gully erosion.

This complex is poorly suited to pasture or hay. The slope and exposed sandstone bedrock severely limit use as pasture or hayland. Also, there is a severe hazard of erosion on Nauvoo soil.

Coniferous trees are suited to this complex. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant on Nauvoo soil. The potential productivity is moderate. There is a slight limitation for the use of equipment on Nauvoo soil. Also the hazard of erosion is slight on this soil, and the rate of seedling mortality is slight. The limitation, hazard, and rate of seedling mortality on Nauvoo soil in this complex with areas of Rock outcrop increase from slight to moderate or severe. Mechanical harvesting and planting in this complex can cause severe erosion and degrade the quality of the water. These problems can be overcome by leaving residue on the surface.

Nauvoo soil is suited to building site development and to use for sanitary facilities. Depth to bedrock, permeability, and slope are moderate limitations for use of this soil as septic tank absorption fields. Slope is a

moderate to severe limitation for use for other types of sanitary facilities, but these limitations can be overcome by proper design. Because this soil is strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Slope is a moderate limitation for use of this soil for other types of building site development. The areas of Rock outcrop are not suited to development.

This Nauvoo soil is in land capability subclass IVe and in woodland ordination group 2o. The areas of Rock outcrop are in land capability subclass VIIIs but are not assigned to a woodland ordination group.

NbF—Nauvoo-Rock outcrop complex, 15 to 30 percent slopes. This complex consists of deep, moderately steep, well drained soils and areas of exposed sandstone bedrock on hillsides of the Chandler and Blount Mountains. The slope is complex and concave. Rock outcrops are bluff-type escarpments. Individual areas are 20 to 100 acres. The Nauvoo soil and Rock outcrop are in areas that are so small and intricately mixed that it was not practical to map them separately.

Nauvoo soil and soils that are similar make up about 60 percent of the map unit. Typically, the surface layer is grayish brown sandy loam to a depth of about 4 inches. The next layer is brown sandy loam to a depth of about 12 inches. The subsoil is sandy clay loam. The upper part of the subsoil is strong brown to a depth of 23 inches, and the lower part is yellowish red to a depth of 46 inches. Below that is weathered sandstone bedrock to a depth of 60 inches or more. In places, there are soils that are similar to the Nauvoo soil, but they have bedrock at a depth of 30 to 40 inches.

Rock outcrop and exposures that are similar make up about 20 percent of the map unit. These areas consist of exposed masses of hard sandstone bedrock that range up to several acres. Rock exposures generally do not project more than 10 feet above the ground level. In some areas, there are similar exposures of stone-size to boulder-size sandstone rock that are essentially bare of soil material and vegetation.

Important Soil Properties:

Permeability—Moderate in Nauvoo soil
Available Water Capacity—Medium in Nauvoo soil
Soil Reaction—Very strongly acid to medium acid
Organic Matter Content—Moderately low in Nauvoo soil
Natural Fertility—Low in Nauvoo soil
Depth to Bedrock—40 to 60 inches in Nauvoo soil
Root Zone—40 to 60 inches in Nauvoo soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are some areas of Townley soils and also some areas of soils that are shallow to hard sandstone bedrock. Also included are soils that are very poorly drained. These soils are frequently flooded for long periods throughout the year and generally are shown by either a perennial or an intermittent stream symbol. The included soils are dissimilar to the Nauvoo soil and Rock outcrop, and their use and management are different. The included soils make up about 20 percent of the map unit, but individual areas generally are 100 feet or less in width and less than 5 acres.

This complex primarily is used as woodland. In some small areas, the Nauvoo soil has been cleared and is used for pasture. Many areas of this complex are used for Streamside Management Zones. These zones help maintain the quality of the water.

This complex is not suited to cultivated crops. The slope and exposed sandstone bedrock severely limit this use. There is a severe hazard of erosion on Nauvoo soil, and in areas where water concentrates, this soil is subject to gully erosion.

This complex is not suited to pasture or hay. The slope and exposed sandstone bedrock severely limit this use. Also, the hazard of erosion on the Nauvoo soil is severe.

Coniferous trees are suited to this complex. Loblolly pine, yellow-poplar, and sweetgum are recommended trees to plant on Nauvoo soil; the potential productivity is moderate. There is a moderate limitation for use of equipment on Nauvoo soil; erosion is a hazard; and the rate of seedling mortality is slight. The limitation, hazard, and rate of seedling mortality on Nauvoo soil in complex with areas of Rock outcrop increase from slight or moderate to severe. Mechanical harvesting and planting on the soils in this complex can cause severe erosion and degrade the quality of the water. These problems are difficult to overcome.

Nauvoo soil is suited to building site development and to use for sanitary facilities. Depth to bedrock, permeability, and slope are moderate limitations for use of this soil as septic tank absorption fields. Slope is a moderate to severe limitation for use for other types of sanitary facilities, but these limitations can be overcome by proper design. Slope is a severe limitation for use of this soil for most types of building site development. The areas of Rock outcrop are not suited to development.

This Nauvoo soil is in land capability subclass VIe and in woodland ordination group 2r. The areas of Rock outcrop are in land capability subclass VIIIs and are not assigned to a woodland ordination group.

NCR—Nauvoo-Rock outcrop association, rolling. This map unit consists of deep, well drained soil and areas of sandstone bedrock on plateaus of the Pottsville geologic formation in the central part of the county. Elevation is more than 800 feet. This Nauvoo soil and Rock outcrop are in a regular and repeating pattern. The slope ranges from about 2 to 15 percent. Individual areas are 40 to 400 acres or more.

Nauvoo soil and soils that are similar are on high elevations and make up about 56 percent of the map

unit. Typically, the surface layer is yellowish brown sandy loam to a depth of about 6 inches. The subsoil is strong brown sandy loam to a depth of 16 inches and yellowish red sandy clay loam to a depth of 46 inches. The underlying material is mottled, red and brown loam to a depth of 52 inches. Below that is soft weathered sandstone to a depth of more than 60 inches. In places, there are soils that are similar to the Nauvoo soil, but they have bedrock at a depth of less than 40 inches.

Rock outcrop and exposures that are similar are on the low elevations and make up about 10 percent of the map unit. These areas consist of exposures of hard sandstone bedrock that range up to several acres. Rock exposures generally project up to 50 feet above the ground level. In some areas, there are similar exposures of stone-size to boulder-size sandstone rock that are essentially bare of soil material and vegetation.

Important Soil Properties:

Permeability—Moderate in Nauvoo soil
Available Water Capacity—Medium in Nauvoo soil
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low in Nauvoo soil
Natural Fertility—Low in Nauvoo soil
Depth to Bedrock—40 to 60 inches in Nauvoo soil
Root Zone—40 to 60 inches in Nauvoo
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are some areas of Townley soils and also some areas of minor soils that are shallow to sandstone bedrock. Townley soils are intermingled with the Nauvoo soil. The shallow soils are between the Nauvoo soil and the areas of Rock outcrop. Also, some areas have been strip-mined for coal. These areas generally are less than 200 feet wide, and the resulting spoil areas generally are less than 400 feet wide.

In most areas, this association primarily is used as woodland. Some areas near paved roads are in low density residential use.

This map unit is not suited to cultivated crops or to pasture and hay crops because of the steep slope, the hazard of erosion, and the Rock outcrops and fragments on the surface layer. In some areas, the included soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to this map unit. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant on Nauvoo soil; the potential productivity is moderate. There is a slight limitation for use of equipment on the Nauvoo soil. The hazard of erosion on this soil is slight, and also the rate of seedling mortality is slight. Rock outcrop is a severe concern for management.

This association is not suited to building site development or to use for sanitary facilities because of the limited access, the hazard of erosion, and the Rock outcrop.

This Nauvoo soil is in land capability subclass IVe and in woodland ordination group 2o. The areas of Rock outcrop are in land capability subclass VIIIs and are not assigned a woodland ordination group.

NCS—Nauvoo-Rock outcrop association, steep. This map unit consists of deep, well drained, soil and areas of sandstone bedrock on plateaus of the Pottsville geologic formation in the central part of the county. Elevation is more than 800 feet. The landscape is dissected by many drainageways. This Nauvoo soil and Rock outcrop are in a regular and repeating pattern. The slope ranges from about 15 to 35 percent. Individual areas are a few hundred to several thousand acres.

Nauvoo soil and soils that are similar are on high elevations and make up about 40 percent of the map unit. Typically, the surface layer is brown sandy loam to a depth of about 4 inches. The subsoil is sandy clay loam. The upper part of the subsoil is strong brown to a depth of 16 inches, and the lower part is yellowish red to a depth of 48 inches. Below that is soft weathered sandstone to a depth of 60 inches or more. In places, there are soils that are similar to the Nauvoo soil, but they have bedrock at a depth of less than 40 inches.

Rock outcrop and exposures that are similar are on low elevations and make up about 30 percent of the map unit. These areas consist of exposed masses of hard sandstone bedrock that range up to several acres. Rock exposures generally project 5 to 50 feet above the ground level. In some areas, there are similar exposures of stone-size to boulder-size sandstone rock that are essentially bare of soil material and vegetation.

Important Soil Properties:

Permeability—Moderate in Nauvoo soil
Available Water Capacity—Medium in Nauvoo soil
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low in Nauvoo soil
Natural Fertility—Low in Nauvoo soil
Depth to Bedrock—40 to 60 inches in Nauvoo soil
Root Zone—40 to 60 inches in Nauvoo soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are some areas of Townley soils and also some areas of minor soils that are shallow to sandstone bedrock. Townley soils are intermingled with the Nauvoo soil. The shallow soils are between the Nauvoo soil and the areas of Rock outcrop. Also, some areas have been strip-mined for coal. These areas generally are less than 200 feet wide, and the resulting spoil areas generally are less than 400 feet wide.

In most areas, this association primarily is used as woodland. Some areas near paved roads are in low density residential use.

This map unit is not suited to cultivated crops or to pasture and hay crops because of the steep slope, the

hazard of erosion, and the rock outcrops and fragments on the surface layer. In some areas, the included soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to this map unit. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant on Nauvoo soil; the potential productivity is moderate. There is a moderate limitation for the use of equipment on Nauvoo soil. Erosion is a moderate hazard. Rock outcrop is a severe management concern.

This map unit is not suited to building site development. It is not suited to use for sanitary facilities because of the steep slope, the limited access, the hazard of erosion, and the Rock outcrop.

This Nauvoo soil is in land capability subclass VIIe and in woodland ordination group 2r. The areas of Rock outcrop are in land capability subclass VIIIs and are not assigned a woodland ordination group.

NET—Nauvoo-Townley association, steep. This map unit consists of deep and moderately deep, well drained soils on plateaus of the Pottsville geologic formation in the central part of the county. These soils are at elevations of less than 800 feet. The landscape is dissected by many drainageways. The soils are loamy and clayey and are in a regular and repeating pattern. The slope ranges from about 15 to 35 percent. Individual areas are a few hundred to several thousand acres.

Nauvoo soil and soils that are similar are on the upper two-thirds of the southeast slopes and make up about 41 percent of the map unit. Typically, the surface layer is brown sandy loam to a depth of about 4 inches. The subsoil is strong brown loam to a depth of 16 inches, and it is yellowish red clay loam to a depth of 41 inches. Below that is soft weathered sandstone bedrock extending to a depth of more than 60 inches. In places, there are soils that are similar to the Nauvoo soil, but they have bedrock at a depth of less than 40 inches.

Townley soil and soils that are similar are on the lower two-thirds of the northwest slopes and make up about 38 percent of the map unit. Typically, the surface layer is brown loam to a depth of about 3 inches. The subsoil is strong brown clay loam to a depth of 11 inches, and it is yellowish red silty clay loam to a depth of 36 inches. In places, there are soils that are similar to the Townley soil, but they have a subsoil that extends to a depth of 40 to 50 inches.

Important Soil Properties:

Permeability—Moderate in Nauvoo soil, slow in Townley soil
Available Water Capacity—Medium in Nauvoo soil and low in Townley soil
Soil Reaction—Very strongly acid to medium acid in Nauvoo soil and extremely acid to strongly acid in Townley soil
Organic Matter Content—Moderately low in Nauvoo soil and low in Townley soil
Natural Fertility—Low
Depth to Bedrock—40 to 60 inches in Nauvoo soil and 20 to 40 inches in Townley soil
Root Zone—40 to 60 inches in Nauvoo soil and 20 to 40 inches in Townley soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are soils that are shallow to hard sandstone bedrock. These soils are on the higher elevations. Also, some areas have been strip-mined for coal. These areas generally are less than 300 feet wide, and the resulting spoil areas generally are less than 500 feet wide.

In most areas, the soils in this association primarily are used as woodland. In some areas near paved roads, these soils are in low density residential use.

These soils are not suited to cultivated crops or to pasture and hay crops because of the steep slope and the hazard of erosion. In some less sloping areas, the soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to these soils. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant on Nauvoo soil; the potential productivity is moderate. Loblolly pine is the recommended tree to plant on Townley soil; the potential productivity is low. There is a moderate limitation for the use of equipment on the Nauvoo and Townley soils. The hazard of erosion on these soils is moderate (fig. 10). The rate of seedling mortality on the Townley soil is severe.

The soils in this association are not suited to building site development or to use for sanitary facilities because of the steep slope and the limited access.

The Nauvoo and Townley soils are in land capability subclass VIIe. Nauvoo soil is in woodland ordination group 2r. Townley soil is in woodland ordination group 4r.

NgC—Nella gravelly sandy loam, 4 to 12 percent slopes. This deep, well drained, gently sloping to strongly sloping soil is on terraces, hillsides, and foot slopes. The slope is complex and convex. Individual areas are 10 to 50 acres.

Typically, the surface layer is brown gravelly sandy loam to a depth of about 4 inches. The subsurface layer is yellowish brown gravelly sandy loam to a depth of about 9 inches. The subsoil is strong brown gravelly loam to a depth of 14 inches, yellowish red gravelly clay loam to a depth of 24 inches, and red gravelly clay loam to a depth of 70 inches or more. In places, there are soils that are similar to the Nella soil, but they have more than 35 percent coarse fragments below a depth of 40 inches.

Figure 10.—A cutover area of Nauvoo-Townley association, steep. When trees are mechanically harvested on these soils, residue left on the surface reduces erosion during the regrowth of the plant cover.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Low
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Allen, Minvale, Nauvoo, and Townley soils. The included soils make up about 25 percent of the map unit, but individual areas generally are less than 5 acres. Townley soil is dissimilar to the Nella soil, and their use and management are different. This dissimilar soil makes up about 5 percent of the map unit.

The Nella soil primarily is used as woodland or pasture. In some areas, it is used for cultivated crops or hay.

This soil is poorly suited to cultivated crops. The low available water capacity and the sandstone fragments in the surface layer limit the use of this soil for cultivated crops. Erosion is a moderate hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, a plow pan can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops help reduce runoff and control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. The low available water capacity is a limitation. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited to this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the

pasture and soil in good condition. Sandstone fragments in and on the surface layer limit the use of some management practices on this soil.

Coniferous trees are suited to this soil. The potential productivity is moderate. It is limited by the low available water capacity of the soil. Loblolly pine and yellow-poplar are the recommended trees to plant. Because of the gravelly surface layer, there is a moderate limitation for the use of equipment. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development and to use for sanitary facilities. Seepage and slope severely limit the use of this soil for sewage lagoon areas. These limitations are difficult to overcome. Permeability moderately limits the use of this soil as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping to strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. There are no other significant limitations for use of this soil for other types of building site development.

This Nella soil is in land capability subclass IVe and in woodland ordination group 3x.

NtD—Nella-Townley complex, 6 to 15 percent slopes. This complex consists of deep and moderately deep, strongly sloping, well drained soils on uplands and hillsides. The slope is complex and concave. Individual areas are 20 to 100 acres. The Nella and Townley soils are in areas that are so small and form such intricate patterns that it was not practical to map them separately.

Nella soil and soils that are similar make up about 54 percent of the map unit. Typically, the surface layer is brown gravelly sandy loam to a depth of about 4 inches. The subsoil is gravelly clay loam. It is strong brown to a depth of 12 inches, and it is yellowish red to a depth of 70 inches or more. In places, there are soils that are similar to the Nella soil, but they have more than 35 percent coarse fragments below a depth of 40 inches.

Townley soil and soils that are similar make up about 28 percent of the map unit. Typically, the surface layer is brown loam to a depth of about 5 inches. The subsoil is strong brown clay loam to a depth of 16 inches and yellowish red silty clay loam to a depth of about 30 inches. Below that is weathered shale to a depth of more than 60 inches. In places, there are soils that are similar to the Townley soil, but they have a clayey subsoil more than 40 inches thick.

Important Soil Properties:

Permeability—Moderate in Nella soil and slow in the Townley soil
Available Water Capacity—Low
Soil Reaction—Very strongly acid or strongly acid in Nella soil and extremely acid to strongly acid in Townley soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches in Nella soil and 20 to 40 inches in Townley soil
Root Zone—More than 60 inches in Nella soil and 20 to 40 inches in Townley soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are small areas of Tanyard, Tasso, and Waynesboro soils. These soils have slope of 2 to 8 percent. They are between the Nella and Townley soils and soils in the map units that are in lower positions on the landscape. Also included are soils that are very poorly drained. These soils are frequently flooded for long periods throughout the year and generally are shown by either a perennial or an intermittent stream symbol. The included soils are dissimilar to the Nella and Townley soils, and their use and management are different. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 100 feet in width and less than 5 acres.

The soils in this complex primarily are used as woodland. In some small areas, the soils have been cleared and are used as pasture. In some areas, the soils are used for Streamside Management Zones. These zones help maintain the quality of the water.

These soils are poorly suited to cultivated crops because of the slope and the low available water capacity of the Nella and Townley soils. The hazard of erosion on the Townley soil is severe. Some of the included soils that are on terraces and toe slopes are suited to cultivated crops, but the small size and accessibility of these areas limit the use of these soils for this use. In areas where water concentrates, Townley soil is subject to gully erosion.

These soils are suited to pasture and hay. The slope, the severe hazard of erosion, and the low available water capacity limit the use of the Nella and Townley soils for pasture and hay. In addition, the gravelly surface layer of Nella soil restricts some management practices.

Coniferous trees are suited to these soils. Loblolly pine and yellow-poplar are the recommended trees to plant on Nella soil; the potential productivity is moderate. There is a moderate limitation for the use of equipment on the Nella soil. Loblolly pine is a recommended tree to plant on Townley soil; the potential productivity is low. There is a moderate limitation for the use of equipment on the Townley soil, and the rate of seedling mortality on this soil is moderate.

These Nella and Townley soils are poorly suited to building site development and to use for most sanitary facilities. Slope, seepage, and permeability moderately limit the use of the Nella soil for these uses. Depth of bedrock, permeability, and the shrink-swell potential of

the Townley soil are severe limitations for these uses. These limitations are difficult to overcome.

Nella soil is in land capability subclass IVe and in woodland ordination group 3x. Townley soil is in land capability subclass VIe and in woodland ordination group 4r.

Pd—Pits and Dumps. This map unit consists of open excavations from which the soil and part of the underlying material, such as limestone, sandstone, chert, and gravel, have been removed. It also consists of associated Dumps. Piles of spoil material and materials that have been dredged have been deposited on these areas. Mapped areas are Pits, Dumps, or part Pits and part Dumps. Areas where dredging activities occur are partly filled with water in the winter and the spring.

Important Soil Properties:

Permeability—Variable
Available Water Capacity—Very low
Soil Reaction—Variable
Organic Matter Content—Very low
Natural Fertility—Very low
Depth to Bedrock—More than 60 inches
Root Zone—None
Water table—None within a depth of 6 feet
Flooding—None

In most areas, Pits are 10 to 100 feet deep and are partly or completely surrounded by vertical walls of exposed geologic strata. These areas are bare of vegetation, and the hazard of erosion severely limits the use of the soil. The very low available water capacity and very low natural fertility makes revegetation difficult or impossible.

Included in mapping are areas of soil material that are covered with sparse vegetation. These soils make up about 20 percent of the map unit.

This map unit is in land capability subclass VIIIs. It is not assigned to a woodland ordination group.

RNT—Rock outcrop-Nella-Townley association, steep. This map unit consists of areas of sandstone bedrock and of deep and moderately deep, well drained soils on the sides of the Chandler and Blount Mountains. These soils are gravelly and clayey and are in a regular and repeating pattern. The slope ranges from about 20 to 40 percent. Individual areas are 100 to 400 acres or more.

Rock outcrop and exposures that are similar are on the upper one-third of the slope and make up about 39 percent of the map unit. These areas consist of exposures of hard sandstone bedrock that are up to several acres. Rock outcrop generally projects 5 to 20 feet above ground level. In some areas there are similar exposures of stone-size to boulder-size sandstone and limestone rock that are essentially devoid of soil material and vegetation.

Nella soil and soils that are similar are on the middle one-third of the slope and make up about 29 percent of the map unit. Typically, the surface layer is brown gravelly sandy loam to a depth of about 3 inches. The subsoil is brown gravelly loam to a depth of 16 inches, and it is yellowish red gravelly clay loam to a depth of 60 inches or more. In places, there are soils that are similar to the Nella soil, but they have more than 35 percent coarse fragments within a depth of 40 inches of the subsoil.

Townley soil and soils that are similar are on the lower one-third of the slope and make up about 29 percent of the map unit. Typically, the surface layer is dark yellowish brown loam to a depth of about 3 inches. The subsoil is strong brown silty clay loam to a depth of 9 inches, and it is red clay to a depth of 26 inches or more. Below that is weathered shale to a depth of more than 60 inches. In places, there are soils that are similar to the Townley soil, but they have a subsoil that extends to a depth of 40 to 50 inches.

Important Soil Properties:

Permeability—Moderate in Nella soil and slow in Townley soil
Available Water Capacity—Low in Nella and Townley soils
Soil Reaction—Very strongly acid or strongly acid in Nella soil and extremely acid to strongly acid in Townley soil
Organic Matter Content—Low in Nella and Townley soils
Natural Fertility—Low in Townley and Nella soils
Depth to Bedrock—More than 60 inches in the Nella soil and 20 to 40 inches in the Townley soil
Root Zone—More than 60 inches in the Nella soil and 20 to 40 inches in the Townley soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are soils that are shallow to sandstone bedrock. These soils are on the higher elevations.

In most areas, the soils in this map unit are used as woodland.

These soils are not suited to cultivated crops or to pasture and hay crops because of the steep slope, the hazard of erosion, the Rock outcrop, and fragments on the surface layer. In some areas, the less sloping soils are poorly suited to suited to pasture and hay crops. These areas generally are small or isolated.

Coniferous trees are suited to the soils of this association. Loblolly pine and yellow-poplar are the recommended trees to plant on the Nella soil; the potential productivity is moderate. Loblolly pine is the recommended tree to plant on the Townley soil; the potential productivity is low. There is a moderate to severe limitation for use of equipment on these soils. Erosion is a moderate to severe hazard. The rate of

seedling mortality is also moderate to severe on these soils.

These soils are not suited to building site development or to use for sanitary facilities because of steep slope, Rock outcrop, and limited access.

Areas of Rock outcrop are in land capability subclass VIIIs. They are not assigned to a woodland ordination group. Nella and Townley soils are in land capability subclass VIIe. Nella soil is in woodland ordination group 3x, and Townley soil is in woodland ordination group 4r.

TaA—Tanyard silt loam, 0 to 2 percent slopes. This deep, moderately well drained, nearly level soil is on flood plains. The slope is smooth and slightly concave to slightly convex. Individual areas are 10 to 200 acres or more.

Typically, the surface layer is brown silt loam to a depth of about 6 inches. The subsoil is yellowish brown silt loam to a depth of 10 inches; yellowish brown and brownish yellow loam to a depth of 59 inches; and mottled, yellowish brown, light gray, and yellow sandy clay loam to a depth of 72 inches or more. In places, there are soils that are similar to the Tanyard soil, but the subsoil is less than 60 inches thick.

Important Soil Properties:

Permeability—Moderately slow
Available Water Capacity—High
Soil Reaction—Very strongly acid to medium acid in the upper part of the solum and medium acid to neutral below a depth of about 40 inches
Organic Matter Content—Moderately low
Natural Fertility—Medium
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—A seasonal high water table is at a depth of 18 to 30 inches during winter and early in the spring
Flooding—Frequently flooded for brief to very brief periods during winter and early in the spring

Included in mapping are a few areas of Gaylesville, Tasso, Townley, and Wax soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. These included soils are dissimilar to the Tanyard soil, and their use and management are different.

The Tanyard soil primarily is used as pasture or woodland. In some areas, the soil is used for cultivated crops or hay.

This soil is suited to cultivated crops. Wetness and flooding are limitations. Only crops that can adapt to excessive wetness should be planted. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. Surface drainage and subsurface drainage help lower the water table. These drainage systems also control wetness that can delay spring planting.

This soil is suited to pasture and hay. Flooding and wetness are the main limitations. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous and deciduous trees are suited to this soil. The potential productivity is moderate. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant. Flooding moderately limits the use of equipment on this soil. The rate of seedling mortality is moderate. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development and to use for sanitary facilities. Flooding and wetness are severe limitations that are difficult to overcome.

This Tanyard soil is in land capability subclass IIIw and in woodland ordination group 2w.

TbC—Tasso sandy loam, 4 to 12 percent slopes. This deep, well drained, gently sloping to strongly sloping soil is on foot slopes and stream terraces. The slope is complex and slightly convex or concave. Individual areas are 5 to 50 acres or more.

Typically, the surface layer is brown sandy loam to a depth of about 5 inches. The subsoil is yellowish brown loam to a depth of 25 inches. Below that, it is mottled, yellowish red and pale brown sandy clay loam and mottled, yellowish brown and light brownish gray cherty loam to a depth of 65 inches or more. In places, there are soils that are similar to the Tasso soil, but the subsoil is 50 to 60 inches thick, or the upper part of the subsoil is red or yellowish red.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—20 to 40 inches
Water Table—A perched seasonal high water table is at a depth of 20 to 40 inches for a few days following heavy rainfall during wet periods
Flooding—None

Included in mapping are a few areas of Cane, Minvale, Townley, and Wax soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Minvale and Townley soils are dissimilar to the Tasso soil and their use and management are different. These dissimilar soils make up about 10 percent of the map unit.

The Tasso soil primarily is used as woodland or pasture. In some areas, the soil is used for cultivated crops or hay.

This soil is suited to cultivated crops. Rooting depth is a limitation. Erosion is a moderate hazard. In areas

where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. The low to medium available water capacity is a limitation. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited to this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is moderately suited to building site development. It also is moderately suited to use for sanitary facilities. The slope is a severe limitation for sewage lagoon areas. This limitation is difficult to overcome. Permeability is a moderate limitation to use as septic tank absorption fields, but this limitation can be overcome by proper design. Because this soil is gently sloping to strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Slope, low soil strength, and shrinking and swelling are moderate limitations for the use of this soil for other types of building site development.

This Tasso soil is in land capability subclass IIIe and in woodland ordination group 3o.

TcA—Toccoa sandy loam, 0 to 2 percent slopes. This deep, well drained, gently sloping or sloping soil is on stream terraces and flood plains. The slope is smooth and convex. Individual areas are 10 to 50 acres or more.

Typically, the surface layer is yellowish brown sandy loam to a depth of about 9 inches. The underlying material is brown sandy loam and loamy sand to a depth of 65 inches or more.

Important Soil Properties:

Permeability—Moderately rapid
Avavailable Water Capacity—Low
Soil Reaction—Strongly acid to slightly acid
Organic Matter Content—Low
Natural Fertility—Moderately low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—A seasonal high water table is 30 to 60 inches below the surface during winter and early in spring
Flooding—Occasionally flooded for brief periods during winter and early in the spring; areas below Logan Martin Dam are rarely flooded

Included in mapping are a few areas of Choccolocco, Mooreville, and Wax soils. The included soils make up about 10 percent of the map unit, but individual areas generally are less than 5 acres. Mooreville and Wax soils are dissimilar to the Toccoa soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Toccoa soil primarily is used as pasture or woodland. In some areas, the soil is used for cultivated crops or hay.

This soil is suited to cultivated crops. The low available water capacity is a limitation. Erosion is a slight hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, only crops that can adapt to brief periods of flooding should be planted.

This soil is well suited to pasture and hay. The low available water capacity is a limitation. Deep-rooted plants, such as bahiagrass and bermudagrass, are best suited to this soil. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Plant nutrients are readily leached from the root zone. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil. The potential productivity is high. Loblolly pine is a recommended tree to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development. Seepage, flooding, and wetness are severe limitations for use of this soil for sanitary facilities. Wetness and flooding are moderate to severe limitations to building site development.

This Toccoa soil is in land capability subclass IIw and in woodland ordination group 1o.

TeB—Townley silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on upland ridges and hillsides. The slope is complex and convex. Individual areas are 10 to 200 acres or more.

Typically, the surface layer is dark brown silt loam to a depth of about 4 inches. The subsoil is strong brown silty clay loam to a depth of 12 inches, yellowish red silty clay to a depth of 18 inches, and mottled, gray, red, and brown silty clay to a depth of 25 inches. Below that is weathered shale to a depth of 60 inches or more. In places, there are soils that are similar to the Townley soil, but they have a subsoil that extends to a depth of 40 to 50 inches.

Important Soil Properties:

Permeability—Slow
Available Water Capacity—Low
Soil Reaction—Extremely acid to strongly acid
Organic Matter Content—Low
Natural Fertility—Low

Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Minvale, Nella, Nauvoo, Tasso, and Wax soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 10 acres. These soils are dissimilar to the Townley soil, and their use and management are different.

The Townley soil primarily is used as woodland. In some areas, the soil is used for cultivated crops, or as pasture or hayland.

This soil is suited to cultivated crops. The low available water capacity is a limitation. Erosion is a moderate hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. The low available water capacity is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Plant nutrients are readily leached from the root zone. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil. The potential productivity is low; it is limited by the low available water capacity. Loblolly pine is a recommended tree to plant. The clayey subsoil moderately limits the use of equipment on this soil. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development. Depth to bedrock and permeability severely limit the use of this soil for most types of sanitary facilities. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. Depth to bedrock and shrinking and swelling are moderate limitations for use of this soil for other types of building site development.

This Townley soil is in land capability subclass IIIe and in woodland ordination group 4c.

TeD—Townley silt loam, 6 to 15 percent slopes. This deep, well drained, strongly sloping soil is on upland ridges and hillsides. The slope is complex and convex. Individual areas are 20 to 200 acres or more.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is yellowish red silty clay to a depth of 10 inches and yellowish red silty clay or clay to a depth of 20 inches. Below that, it is mottled, gray and red silty clay loam to a depth of 31 inches. The underlying layer to a depth of 60 inches is weathered shale. In places, there are soils that are similar to the Townley soil, but they have a subsoil that extends to a depth of about 40 to 50 inches.

Important Soil Properties:

Permeability—Slow
Available Water Capacity—Low
Soil Reaction—Extremely acid to strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Minvale, Nella, Nauvoo, and Tasso soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 15 acres. These soils are dissimilar to the Townley soil, and their use and management are different.

This Townley soil primarily is used as woodland. In some areas, it is used for cultivated crops or pasture.

This soil is poorly suited to cultivated crops. The low available water capacity is a limitation. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is suited to pasture and hay. The low available water capacity is a limitation. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Plant nutrients are readily leached from the root zone. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil; the potential productivity is low. It is limited by the low available water capacity of the soil. Loblolly pine is a recommended tree to plant. The clayey subsoil moderately limits the use of equipment on this soil. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

This soil is poorly suited to building site development. Depth to bedrock and permeability severely limit the use of this soil for most types of sanitary facilities. Because this soil is strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Depth to bedrock, shrinking and swelling, and slope are moderate limitations for use of the soil for other types of building site development.

This Townley soil is in land capability subclass VIe and in woodland ordination group 4c.

TgF—Townley gravelly loam, 15 to 30 percent slopes. This moderately deep, well drained, moderately steep soil is on hillsides. The slope is complex and convex. Individual areas are 100 to 400 acres or more.

Typically, the surface layer is very dark grayish brown gravelly loam to a depth of about 4 inches. The subsoil is strong brown clay to a depth of 10 inches, and it is yellowish red clay to a depth of 24 inches. Below that is weathered shale to a depth of more than 60 inches.

Important Soil Properties:

Permeability—Slow
Available Water Capacity—Low
Soil Reaction—Extremely acid to strongly acid
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Conasauga, Minvale, Nella, and Nauvoo soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 10 acres. Minvale and Nella soils are dissimilar to the Townley soil, and their use and management are different. These dissimilar soils make up about 15 percent of the map unit.

The Townley soil primarily is used as woodland. In some areas, the soil is used as pasture or hayland.

This soil is not suited to cultivated crops. The slope and the low available water capacity are limitations. Erosion is a severe to very severe hazard. In areas where water concentrates, this soil is subject to gully erosion. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is poorly suited to pasture and hay because of the slope, the hazard of erosion, and the low available water capacity.

Coniferous trees are suited to this soil. The potential productivity is low; it is limited by the low available water capacity. Loblolly pine is a recommended tree to plant. The clayey subsoil and the slope severely limit the use of equipment on this soil. The erosion hazard is moderate. The rate of seedling mortality is also moderate.

This soil is not suited to building site development or to use for sanitary facilities. Slope, depth to bedrock, and permeability are severe limitations for these uses. These limitations are difficult to overcome.

This Townley soil is in land capability subclass VIIe and in woodland ordination group 4r.

TNR—Townley-Nauvoo association, rolling. This map unit consists of moderately deep and deep, well drained soils on plateaus of the Pottsville geologic formation in the central part of the county. These soils are at elevations below 800 feet. The soils are clayey and loamy and are in a regular and repeating pattern. The slope ranges from about 2 to 15 percent.

Townley soil and soils that are similar are on the lower two-thirds of the northwest slopes and make up about 46 percent of the map unit. Typically, the surface layer is dark brown loam to a depth of about 4 inches. The next layer is strong brown loam to a depth of about 14 inches. The subsoil is yellowish red silty clay loam to a depth of 19 inches, and it is yellowish red clay to a depth of 27 inches. Below that is weathered shale to a depth of more than 60 inches. In places, there are soils that are similar to the Townley soil, but the subsoil is more than 40 inches thick.

Nauvoo soil and soils that are similar are on the upper two-thirds of the southeast slopes and make up about 43 percent of the map unit. Typically, the surface layer is brown sandy loam to a depth of about 8 inches. The subsoil is brown sandy clay loam to a depth of 12 inches, and it is yellowish red sandy clay loam to a depth of 42 inches. Below that is weathered sandstone to a depth of more than 60 inches. In places, there are soils that are similar to the Nauvoo soil, but weathered sandstone is at a depth of 30 to 40 inches.

Important Soil Properties:

Permeability—Slow in Townley soil and moderate in Nauvoo soil
Available Water Capacity—Low in Townley soil and moderate in Nauvoo soil
Soil Reaction—Extremely acid to strongly acid in Townley soil and very strongly acid to medium acid in Nauvoo soil
Organic Matter Content—Low in Townley soil and moderately low in Nauvoo soil
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches in Townley soil and 40 to 60 inches in Nauvoo soil
Root Zone—20 to 40 inches in Townley soil and 40 to 60 inches in Nauvoo soil
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are soils that are shallow to sandstone bedrock. These soils are on the narrow ridgetops. In some areas, limestone bedrock outcrops are on the lower one-fourth of the northwest slope. Some areas have been strip-mined for coal. These mined areas generally are less than 300 feet wide, and the resulting spoil areas are less than 500 feet wide.

In most areas, these soils are used mainly as woodland. In some areas near paved roads, the soils are in low density residential use.

These soils are not suited to cultivated crops or to pasture or hay crops because of the steep slope and the hazard of erosion. In some less sloping areas, the soils are poorly suited to pasture or hay crops. These areas generally are small or isolated.

Coniferous trees are suited to the soils of this association. Loblolly pine is a recommended tree to plant on the Townley soil; the potential productivity is low. Loblolly pine, yellow-poplar, and sweetgum are the recommended trees to plant on the Nauvoo soil; the potential productivity is moderate. There is a slight to moderate limitation for the use of equipment on the soils of this association. The erosion hazard is slight.

The soils of this association are poorly suited to building site development and to use for sanitary facilities because of limited access.

Townley soil is in land capability subclass VIe and in woodland ordination group 4c. Nauvoo soil is in land capability subclass IVe and in woodland ordination group 2o.

UtB—Urban land-Townley complex, 2 to 8 percent slopes. This complex consists of areas of Urban land and of gently sloping, moderately well drained soil on uplands. The slope is complex and convex. Individual areas are 20 to 70 acres or more. The areas of Urban land and Townley soil are so small and so intricately mixed that it was not practical to map them separately.

Urban land makes up about 60 percent of the map unit. In these areas, the soil is covered by houses, streets, driveways, and parking areas.

Townley soil and soils that are similar make up about 20 percent of the map unit. Typically, the surface layer is dark brown silt loam to a depth of about 4 inches. The subsoil is strong brown silty clay loam to a depth of 12 inches, and it is yellowish red silty clay to a depth of about 25 inches. Below that is weathered shale to a depth of more than 60 inches.

Important Soil Properties:

Permeability—None in Urban land and slow in the Townley soil
Available Water Capacity—None in Urban land and low in the Townley soil
Soil Reaction—Variable in Urban land and extremely acid to strongly acid in the Townley soil
Organic Matter Content—Low
Natural Fertility—Low
Depth to Bedrock—20 to 40 inches
Root Zone—20 to 40 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are soils that have been so altered by construction activities that they have lost their natural properties. Also included are areas of Minvale and Wax soils. Minvale soils are on higher elevations than the Urban land and Townley soils, and Wax soils are on lower elevations. The included soils make up about 20 percent of the map unit. Individual areas generally cannot be managed differently from the Townley soil.

In most areas, this complex is artificially drained by sewer systems, gutters, and surface drainage ditches. Some depressions, drainageways, and low-lying areas are flooded by runoff from the adjacent high areas for short periods during high intensity rainfall.

The soil in the undeveloped parts of this map unit is used for parks, as building sites, for lawns and gardens, and as storage sites for industrial products. This soil is suited to lawns, vegetable and flower gardens, trees, and shrubs. It is poorly suited to most building site development and to use for most types of sanitary facilities. Soil erosion generally is not a major problem unless the soil is disturbed and left in a bare, exposed condition for a long time.

Townley soil has severe limitations for most urban uses. Slow permeability limits the use of this soil as septic tank absorption fields. Properly designing and reinforcing foundations of dwellings and small buildings help to prevent the structural damage caused by shrinking and swelling of the soil. Constructing roads and streets on suitable base material will help protect them from damage caused by low soil strength. Onsite investigation is essential to properly evaluate and plan the development for specific sites and uses.

The soils in this map unit are not assigned to a land capability subclass or a woodland ordination group.

WaA—Wax loam, 0 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on flood plains and stream terraces. The slope is smooth and slightly concave. Individual areas are 5 to 50 acres or more.

Typically, the surface layer is dark grayish brown loam to a depth of about 5 inches. The next layer is light yellowish brown and dark grayish brown loam to a depth of about 9 inches. The subsoil is yellowish brown loam to a depth of 25 inches; yellowish brown cherty sandy clay loam that has mottles to a depth of 35 inches; and mottled, light gray and yellowish brown, brittle cherty sandy clay loam to a depth of 65 inches or more. In places, there are soils that are similar to the Wax soil, but they have a friable, loamy subsoil more than 35 inches thick, or the upper part of the subsoil is red or yellowish red.

Important Soil Properties:

Permeability—Slow
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—25 to 35 inches

Figure 11.—Corn is one of the crops that are suited to Wax loam, 0 to 3 percent slopes.

Water Table—A seasonal high water table is at a depth of 18 to 36 inches during winter and early in the spring

Flooding—Occasionally flooded for brief duration during winter and early in the spring

Included in mapping are a few areas of Allen, Cane, Mooreville, Tanyard, and Tasso soils. The included soils make up about 20 percent of the map unit, but individual areas generally are less than 5 acres. Allen, Mooreville, and Tasso soils are dissimilar to the Wax soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

This Wax soil primarily is used as woodland or pasture or for hay or cultivated crops.

This soil is suited to cultivated crops (fig. 11). Suitability is limited by wetness and the moderately deep root zone. Erosion is a slight hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. Subsurface drains and surface drains help lower the water table. These drainage systems also

control wetness that can delay spring planting. Only crops that can adapt to wetness should be planted on this soil.

This soil is suited to pasture and hay. Wetness is a limitation. Surface drainage can be used to remove excess water. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition. Plant nutrients are readily leached from the root zone. Plants respond to frequent, light applications of lime and fertilizer.

Coniferous trees are suited to this soil. The potential productivity is moderate; it is limited by the medium available water capacity. Loblolly pine, slash pine, and longleaf pine are recommended trees to plant. Wetness and flooding moderately limit the use of equipment on this soil. There are no other significant limitations to mechanical harvesting, site preparation, or planting.

The soil is not suited to building site development or to use for sanitary facilities. Flooding and wetness severely limit the use of this soil for most uses. These limitations are difficult to overcome.

This Wax soil is in land capability subclass IIw and in woodland ordination group 3w.

WyB—Waynesboro sandy loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on stream terraces. The slope is smooth and slightly concave or slightly convex. Individual areas are 5 to 100 acres or more.

Typically, the surface layer is brown sandy loam to a depth of about 8 inches. The subsoil is yellowish red clay loam to a depth of 23 inches and red clay to a depth of 60 inches or more.

Important Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Choccolocco, Holston, and Nella soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres. Nella soils are dissimilar to the Waynesboro soil, and their use and management are different. These dissimilar soils make up about 5 percent of the map unit.

The Waynesboro soil primarily is used for cultivated crops. In some areas, the soil is used as woodland or hayland or for pasture.

This soil is well suited to cultivated crops. Erosion is a moderate hazard. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion.

This soil is well suited to pasture and hay. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and the soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate; it is limited by the medium available water capacity. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is well suited to building site development. It also is well suited to use for sanitary facilities. Seepage and slope are moderate limitations for sewage lagoon areas. Permeability and the clayey subsoil are moderate limitations for use for other types of sanitary facilities, but these limitations can be overcome by proper design. Because this soil is gently sloping, minimal cut and fill material is needed for site preparation for small commercial buildings. Shrinking and swelling and the clayey subsoil moderately limit the use of this soil for other types of building site development.

This Waynesboro soil is in land capability subclass IIe and in woodland ordination group 3o.

WyD—Waynesboro sandy loam, 6 to 15 percent slopes. This deep, well drained, strongly sloping soil is on stream terrace hillsides. The slope is complex and convex. Individual areas are 5 to 50 acres or more.

Typically, the surface layer is brown sandy loam to a depth of about 5 inches. The subsoil is yellowish red clay loam to a depth of 18 inches. Below that, it is mottled, yellowish red, red, and reddish yellow clay to a depth of 60 inches or more. In places, there are soils that are similar to the Waynesboro soil, but they have a subsoil that extends to a depth of 50 to 60 inches.

mportant Soil Properties:

Permeability—Moderate
Available Water Capacity—Medium
Soil Reaction—Very strongly acid or strongly acid
Organic Matter Content—Moderately low
Natural Fertility—Low
Depth to Bedrock—More than 60 inches
Root Zone—More than 60 inches
Water Table—None within a depth of 6 feet
Flooding—None

Included in mapping are a few areas of Holston and Nella soils. The included soils make up about 15 percent of the map unit, but individual areas generally are less than 5 acres. Nella soils are dissimilar to the Waynesboro soil, and their use and management are

different. These dissimilar soils make up about 5 percent of the map unit.

The Waynesboro soil primarily is used as woodland or pasture. In some areas, the soil is used for cultivated crops and hay.

This soil is poorly suited to cultivated crops. Suitability is limited by the small size of many areas of this soil. Erosion is a severe hazard. In areas where water concentrates, this soil is subject to gully erosion. If the soil is tilled, plow pans can form and restrict root growth of some annual crops. Returning crop residue to the soil helps maintain tilth. If this soil is cultivated, conservation tillage, contour farming, stripcropping, and the use of cover crops reduce runoff and help control erosion. Terraces also help to control erosion, but they are difficult to install.

This soil is suited to pasture or hay. The slope and the hazard of erosion are limitations. Deferred grazing during wet periods helps prevent soil compaction and helps keep the pasture and soil in good condition.

Coniferous trees are suited to this soil. The potential productivity is moderate. Loblolly pine and yellow-poplar are the recommended trees to plant. There are no significant limitations to mechanical harvesting, site preparation, or planting.

This soil is suited to building site development. It also is suited to use for sanitary facilities. The slope is a severe limitation for sewage lagoon areas. This limitation is difficult to overcome. Permeability and the clayey subsoil are moderate limitations for use for other types of sanitary facilities, but these limitations can be overcome by proper design. Because this soil is gently sloping to strongly sloping, cut and fill material is needed for site preparation for small commercial buildings. Shrinking and swelling, the clayey subsoil, and the slope moderately to severely limit the use of this soil for other types of building site development.

This Waynesboro soil is in land capability subclass IVe and in woodland ordination group 3o.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in St. Clair County are listed.

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. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 8 percent. Soils that have a high water table or are subject to flooding may qualify as prime farmland if the limitations or hazards are overcome by drainage or flood control. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More detailed information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

About 36,300 acres in St. Clair County, or 9 percent of the county, is prime farmland. Areas are scattered throughout the county.

The trend in land use in the county has been the conversion of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and difficult to cultivate, and generally less productive than prime farmland.

The following map units, or soils, make up prime farmland in St. Clair County. Some areas of these soils, however, are urban and built-up land, which is defined as any contiguous unit of land 10 acres or more that is used for nonfarm uses including housing, industrial and commercial sites, sites for institutions or public buildings, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, and water control structures. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 5. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

AeB Allen gravelly sandy loam, 2 to 8 percent slopes
CaB Cane loam, 2 to 8 percent slopes
ChA Choccolocco silt loam, 0 to 2 percent slopes
EmA Emory silt loam, 0 to 2 percent slopes
HoB Holston sandy loam, 2 to 6 percent slopes
McB Minvale cherty loam, 2 to 8 percent slopes
NaB Nauvoo sandy loam, 2 to 6 percent slopes
TcA Toccoa sandy loam, 0 to 2 percent slopes
WaA Wax loam, 0 to 3 percent slopes
WyB Waynesboro sandy loam, 2 to 6 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 avoid 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 behavior 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; woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation 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

Robert F. Berry, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

In 1974, there were approximately 13,000 acres of cropland and 30,000 acres of pasture in St. Clair County *(19)*. In 1979, approximately 4,000 acres of soybeans, 2,000 acres of corn, and 2,500 acres of tomatoes were planted in St. Clair County *(18)*. About 12,000 acres of hay was harvested during this period. Other vegetables also are produced in the county. Most of the vegetables are grown on sandstone plateaus on Blount and Chandler Mountains in the northeast part of the county. The acreage in cultivated crops has decreased for several years, but the acreage in pasture has remained fairly constant. There is a trend toward urban development in some parts of the county.

The potential of the soils in St. Clair County for increased production of food and fiber is good. About 130,000 acres of potentially good cropland is being used for pasture and woodland. Approximately 30,000 acres that is located in the lowlands will require some drainage. Yields can be increased on land presently being cultivated if the latest crop production technology is applied. This soil survey will help land users to make sound land management decisions and to facilitate the application of crop production technology.

Field crops that are suited to the soils and climate of St. Clair County include many that are not commonly grown unless economic conditions are favorable. These include peanuts, potatoes, grain sorghum, and similar crops. Soybeans, corn, and wheat are the main crops. Specialty crops include tomatoes, melons, sod, snap beans, peas, greens, cabbage, squash, and peppers. Specialty crops (fig. 12) are well suited to Allen, Dewey, Minvale, Nauvoo, and Townley soils. If economic conditions were suitable, a larger acreage of these specialty crops would be grown. Pecans and apples are the only orchard crops grown commercially in the county, and the acreage is small. Peaches, plums, pears, and blueberries also are well suited to the soils in St. Clair County. Wheat, rye, and oats are the only close-

growing crops that are planted for grain production. However, barley also could be grown.

Information and suggestions for growing specialty crops can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Erosion is a major concern on about three-fourths of the cropland in St. Clair County and on about one-fifth of the pasture. If the slope is more than 2 percent, erosion is a potential hazard. Allen, Cane, Dewey, Holston, Minvale, Nauvoo, and Waynesboro soils are some of the soils that are presently being cultivated that have slopes of 2 percent or more.

Loss of soil through erosion is damaging in several ways. Productivity is reduced as the surface layer is lost and part of the subsoil is mixed into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Townley soil, and on soils that have bedrock below the subsoil that restricts the depth of the root zone, such as Nauvoo soil. Soil erosion results in sediment that causes off-site damage. Control of erosion on farmland minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation use, and for fish and wildlife.

In most fields that are row cropped on Blount and Chandler Mountains, there are areas that are moderately to very severely eroded, and rock outcrops in these areas are common. The lack of topsoil or rock outcrops, either inherited or developed from past erosion, limit the type of cropping that can be profitable. Many of the fields can only be cropped if they are irrigated to supplement the limited amount of water available in the soil for plant growth. However, irrigation is also hampered because of slow water absorption caused primarily by a poor soil structure. Erosion and cropping systems that destroy organic matter and compact the soil promote soil structure deterioration.

Figure 12.—Irrigated crops of corn, melons, potatoes, and peanuts on Dewey loam, 2 to 8 percent slopes.

Figure 13.—No-tillage, as well as cross-slope planting, was used for soybeans grown on Conasauga-Firestone complex, 1 to 8 percent slopes. No-tillage is one of many methods that help control erosion and reduce runoff.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover and crop residue on the land for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, legume and grass forage crops can be incorporated into the cropping system to reduce erosion in sloping areas. They also provide nitrogen and improve tilth for the crops that follow in the rotation.

Conservation tillage and leaving crop residue on the surface increase water infiltration and reduce the hazards of runoff and erosion. No-tillage production for corn, soybeans (fig. 13), and other crops is effective in reducing erosion on sloping areas. This practice can be adapted to most soils in the survey area and can be used in fields that have topographic conditions that are unfavorable for terracing and contouring.

Terraces and diversions shorten the length of slope and reduce runoff and erosion. They are most practical on deep, well drained, sloping soils, such as Allen, Dewey, Holston, and Nauvoo soils. Some soils in St. Clair County are poorly suited to terracing because of irregular slopes, such as Allen, Dewey, and Nauvoo soils; clayey subsoil which will be exposed in the terrace channel, as in Townley soil; or shallow depth to bedrock, such as some soils that were mapped with Nauvoo-Rock outcrop complex. Diversions intercept surface runoff from hilly uplands and divert the water around fields on toe slopes at low elevations.

Contour farming is very effective in reducing erosion on cultivated cropland. It is best suited to soils that have smooth, uniform slopes.

Information on the design of erosion control practices is available in local offices of the Soil Conservation Service.

St. Clair County has an adequate amount of rainfall for crops commonly grown; however, the distribution of rainfall in the spring and summer is such that periods of drought occur during the growing season of most years. Irrigation is needed on most soils to reduce drought stress during most years. Most of the soils commonly used for cultivated crops are suited to irrigation. However, some soils, such as Townley and Conasauga soils, have a slow infiltration rate that limits irrigation potential; and wet soils, such as Wax soil, rarely need irrigation.

Figure 14.—Subsurface drain being installed to lower the water table in Tanyard silt loam, 0 to 2 percent slopes.

Seedbed preparation and cultivation are difficult in eroded, clayey areas because the original friable surface layer has been removed. Additional tillage may be needed to disrupt soil aggregates. Such conditions are common in areas of Conasauga, Firestone, and Townley soils.

Most of the soils that are used for crops in St. Clair County have a sandy loam, loam, or silt loam surface layer that is light in color and low in organic matter content. If the soils have a high silt content and weak structure in the surface layer, they are subject to sealing and crusting when exposed to intense rainfall. The crust is hard when dry and is almost impervious to water. It reduces infiltration of water and increases runoff. Regular additions of crop residue, manure, and other organic material help improve soil structure and reduce crust formation.

The use of large tractors and heavy equipment results in compacted layers in some soils. These layers are generally at a depth of 2 to 12 inches. They are called traffic pans, and these layers restrict plant roots and infiltration of water. Soils that are likely to develop traffic pans include Allen, Holston, and Nauvoo soils.

Soil tilth is an important factor in seed germination, and it affects the infiltration of water into the soil. Soils that have good tilth have a granular and porous surface layer. Tilth is affected by past farming operations. Also, soils that are eroded are likely to have poorer tilth.

Soil fertility is naturally low in most of the soils in St. Clair County. Soils on flood plains and terraces, such as Choccolocco and Emory soils, are a little higher in natural fertility than most soils on uplands. All soils in the county need applications of ground limestone to neutralize soil acidity. Crops on all soils in the county respond well to fertilizer. Available phosphorus and potash levels are generally low in most of the soils. However, some soils have a buildup of phosphorus or potassium because high application rates of commercial fertilizer were used in the past. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of crops, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Wetness is a problem on several soils in St. Clair County, such as Mooreville and Tanyard soils. Some

soils are naturally too wet for production of crop and pasture plants that are commonly grown in the county. On other soils, drainage would increase crop and pasture production. In either case, drainage systems help reduce soil wetness. Surface drainage removes water that accumulates on the soil. Subsurface drainage helps to lower the water table (fig. 14).

Many of the map units that are dominated by well drained or moderately well drained soils contain seep areas near drainageways. The soils immediately adjacent to the drainageways are wet in the spring, and farming operations are delayed during this period. A subsurface drainage system can be used to remove excess water from the wet areas. These areas should be planted earlier and some turnrows eliminated. An underground drainage system can be used to intercept seepage water on toe slopes and divert it from the lower lying cropland.

The design of both surface and subsurface drainage systems depends on the properties of the soil. A combination of surface drainage and tile drainage is needed on some soils to complete the system. Drains have to be more closely spaced in soils that have slow permeability, such as Gaylesville soil, than in the more permeable soils, such as Tanyard soil.

Pasture and hay crops are important in this county (fig. 15). Tall fescue, bahiagrass, common bermudagrass, hybrid bermudagrass, and dallisgrass are the main perennial grasses grown for pasture and hay. Annual cool season grass forages, such as wheat, ryegrass, and rye, are generally grown on cropland for temporary grazing. Arrowleaf clover, white clover, crimson clover, ball clover, red clover, and other cool season forage legumes will grow on several soils in the county, especially if agricultural limestone is applied to the soil in proper amounts.

Most of the annual warm season grass forages that also are generally grown on cropland for temporary grazing are millets, sorghums, and hybrid forage

Figure 15.—In the foreground, Coastal bermudagrass on Cane loam, 2 to 8 percent slopes, is grown for hay. In the background is an area of Minvale-Nella-Townley association, steep, that is grazed as pasture.

Figure 16.—Alfalfa on Dewey loam, 2 to 8 percent slopes, to be used for hay.

sorghums. The warm season forage legumes, such as alfalfa (fig. 16) and sericea and annual lespedezas, are well adapted to most soils used for pasture.

Several management practices are needed on all soils that are used for pasture and hay production. They include proper grazing or cutting at the proper height, weed control, proper fertilization, rotation grazing, and scattering animal droppings. Soils such as Tanyard soils are better suited to summer grazing because of wetness in winter and early in the spring. Cool season perennial grasses, such as tall fescue, should not be grazed in summer so that food reserves will be stored in the plants for growth in the fall. Overgrazing, acid soils, and low fertilization are the greatest problems associated with pasture production. Any of these problems will result in weak plants and poor stands that are quickly infested with weeds. The best way to prevent weeds from becoming established is to maintain a good, dense ground cover with the desired pasture plants.

Yields Per Acre

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

The 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 insures the smallest possible loss.

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

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

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman 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 for commercial crop production.

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

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

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Jerry L. Johnson, forester, Soil Conservation Service, helped prepare this section.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol (woodland suitability) for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *c*, clay in the upper part of the soil; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, c, f, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in a well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or

special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

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

Trees to plant are those that are suited to the soils and to commercial wood production.

St. Clair County has 311,100 acres of commercial forest land, or 75 percent of the total land area of the county. Forest acreage increased 1 percent from 1963 to 1972. This increase was the result of reforestation of idle land. Private landowners own approximately 78 percent of the forest land in the county, and industry owns 21 percent. The remaining 1 percent is other public forest land *(11)*.

The following forest types are in St. Clair County: 5,100 acres of longleaf-slash pine, 102,000 acres of loblolly-shortleaf pine, 76,500 acres of oak-pine, 96,900 acres of oak-hickory, and 30,600 acres of oak-gum-cypress. Forests in St. Clair County have 66,300 acres of sawtimber, 122,400 acres of poletimber, and 122,400 acres of seedlings and saplings *(11)*.

Hardwoods grow best along streams, on slopes with northerly aspects, and in coves. Hardwoods growing on sites where they are not suited make poor quality trees. Many acres of upland hardwood should be converted to pine because most of these sites are well suited to pine (fig. 17). About 69 percent of the soils in the county have a site index of 70 or less for loblolly pine; about 22 percent have a site index of 80 or above for loblolly pine; and about 9 percent have a site index of 90 or above *(16)* for loblolly pine.

The average acre of forest land in Alabama is producing about one-half of its potential wood fiber *(3)*. This would also be true of the average acre in St. Clair County. About 84 percent of the forest land in the county needs either tree planting or timber stand improvement *(1)*.

There are 26 firms employing 100 or more people in St. Clair County that use wood *(2)*. Forest products make a significant contribution to the economy of St. Clair County even though most processing is done outside the county. Other benefits include habitat for wildlife, recreation, and esthetics. Forest land also helps conserve soil and water.

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. 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 recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are

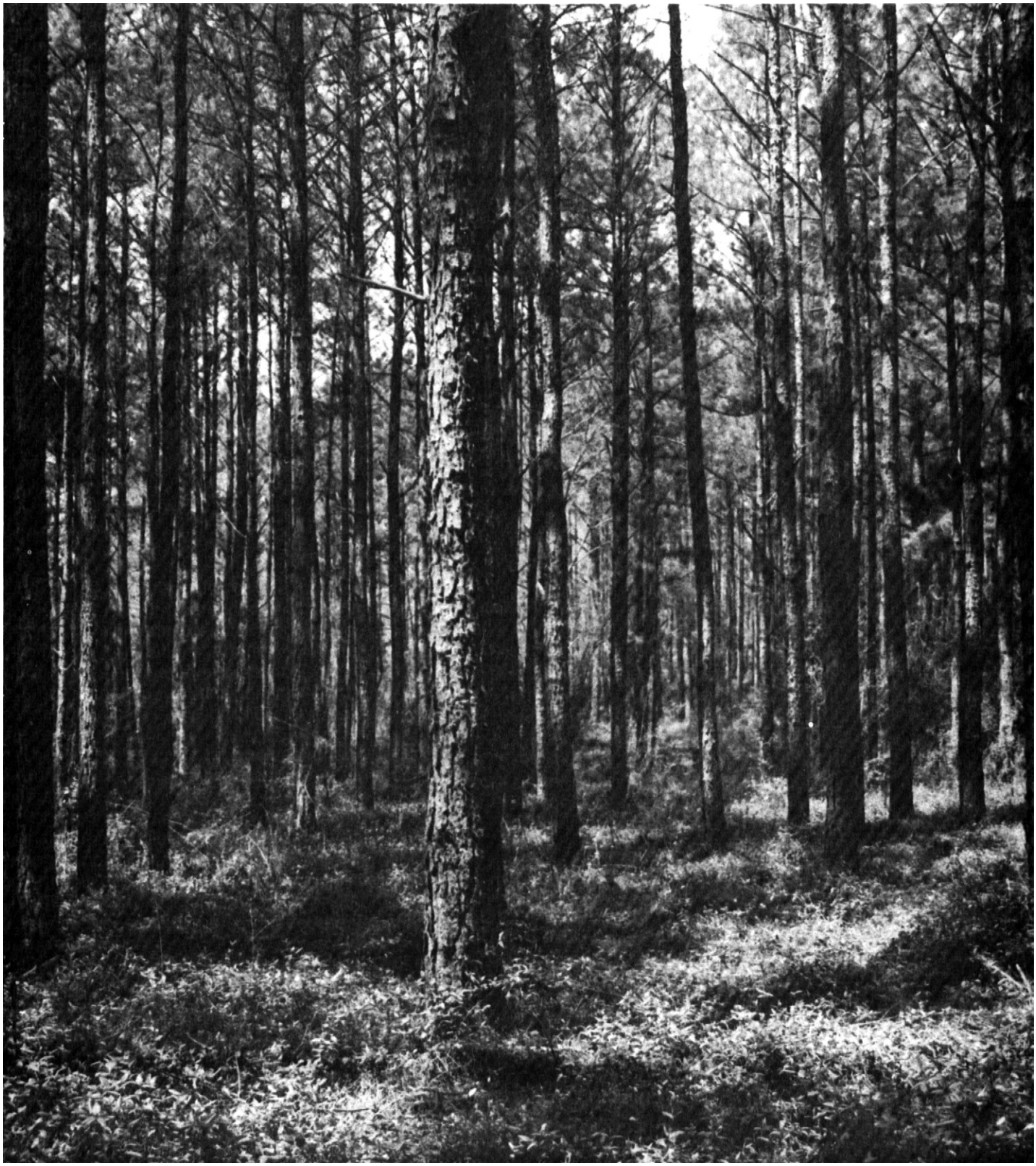


Figure 17.—Stand of high-quality pines on Minvale cherty loam, 2 to 8 percent slopes.

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 by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle 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

Robert E. Waters, biologist, Soil Conservation Service, helped prepare this section.

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

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife, not to present conditions on a particular site. The ratings do not consider present land use, present wildlife habitat, or present wildlife populations. These and other conditions must be determined by on-site examination. This information in table 9 can be used in planning parks, wildlife refuges and sanctuaries, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat; or selecting areas on which to manage wildlife habitat for pay hunting.

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; that moderate soil limitations affect habitat management; and that 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, and unsatisfactory results may be obtained. 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 commonly planted to produce food for wildlife. 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 flood hazard. Soil temperature and soil moisture are also

considerations. Examples of grain and seed crops are corn, soybeans, wheat, sorghums, oats, barley, millets, cowpeas, and sunflowers.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are commonly planted to produce either food or cover, or both, for wildlife. 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, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are tall fescue, bahiagrass, bermudagrass, johnsongrass, lovegrass, lespedezas, orchardgrass, and clover.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide either food or cover, or both, for wildlife. 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are dewberry, blackberry, crotons, pokeweed, partridgepeas, crabgrass, and paspalums.

Hardwood trees and woody understory furnish cover for wildlife and provide food in the form of nuts, buds, catkins, twigs, bark, or foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these native hardwood trees and shrubs are oak, yellow-poplar, cherry, sweetgum, hawthorn, dogwood, persimmon, sassafras, sumac, hickory, black walnut, viburnum, holly, beech, and hackberry. Examples of fruit-producing hardwood shrubs that are available commercially are autumn-olive, pyracantha, crabapple, holly, and dogwood.

Coniferous plants are cone-bearing trees, shrubs or ground cover that either provide cover or furnish food in the form of browse, seeds, or fruit-like cones. Soil properties and features that affect the growth of coniferous plants are depth of the root zone, available water capacity, wetness, and reaction. Examples of coniferous plants are pines and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites and provide either food or cover, or both, for wildlife. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, and slope. Examples of wetland plants are smartweed, wild millet, rushes, sedges, reeds, and cattail.

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, wildlife watering developments, beaver ponds, and other wildlife ponds. A dependable water supply is essential for shallow-water areas.

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

Habitat for openland wildlife consists of cropland, pasture, meadows, lawns, 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, trees, and shrubs. The wildlife attracted to these areas include bobwhite quail, mourning dove, mockingbird, killdeer, meadowlark, field sparrow, cottontail, red fox, and blackbirds.

Habitat for woodland wildlife consists of areas of hardwood trees, coniferous plants, grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, warblers, thrushes, vireos, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, rails, kingfishers, muskrat, mink, beaver, otter, and turtles.

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. The ratings are given in the following tables: 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 must 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 to 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 kind 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 recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the 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, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

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

Sanitary Facilities

Table 11 shows the degree and the 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.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

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

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

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type 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 type 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 soil blowing.

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

Construction Materials

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

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help 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, 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 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 the depth to the water table is 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. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, 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 water table at or near the surface.

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

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and 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, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

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

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

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

Soil Properties

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

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

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 characterize key soils.

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

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "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 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 *(6))* and the system adopted by the American Association of State Highway and Transportation Officials *(5)*.

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, SP-SM.

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

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 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 rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth moving 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 1.7 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, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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 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 change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

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 0.05 to 0.69. 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 table 15, 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 of a soil can be maintained or increased slightly by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils 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 permanent 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, nor is ponded water in swamps.

Table 16 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, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

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 absence of distinctive horizons that form in soils that are not subject to flooding.

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 depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 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 table 16.

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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

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 specified as either soft or hard. If the rock is soft, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard, blasting or special equipment generally is needed for excavation.

Subsidence (not shown in the table) is the settlement of organic soils or of saturated mineral soils of very low density. It results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Soils in St. Clair County are not susceptible to these types of subsidence.

Subsidence can also be caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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 creates a severe corrosion environment. 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.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 17 and the results of chemical analysis in table 18. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Agronomy and Soils Mineralogy Laboratory, Auburn University.

Most determinations were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(15)*.

Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all materials less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of materials less than 2 mm (3A1).

Extractable bases and base saturation—determination by rapid soil-testing methods of Hajek et al. *(10)*.

Reaction (pH)—1:1 water dilution (8C1a).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(17)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten 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 Ultisol.

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 Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

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; 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 Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Entisols that have an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic 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 known kind of soil. 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 Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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 (14)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (17)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allen Series

The Allen series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium and colluvium. The Allen soils are on colluvium fans, foot slopes, toe slopes, and stream terraces. The slope ranges from 2 to 15 percent.

Allen soils are geographically associated with Cane, Mooreville, Conasauga, Minvale, Nauvoo, and Wax soils. Cane and Conasauga soils are on similar landforms as the Allen soils. Cane soils have a fragipan. Conasauga soils have a clayey subsoil that is moderately deep to shale bedrock. Mooreville and Wax soils are on flood

plains adjacent to the Allen soils, and these soils are moderately well drained. Minvale and Nauvoo soils are on uplands adjacent to the Allen soils. Minvale soils have more chert fragments than the Allen soils. Nauvoo soils are moderately deep to sandstone bedrock.

Typical pedon of Allen gravelly sandy loam, 8 to 15 percent slopes; in a pasture 1 mile northeast of Steele, 150 feet south and 1,660 feet west of the northeast corner of sec. 35, T. 16 S., R.1 W.

Ap—0 to 8 inches; reddish brown (5YR 4/4) gravelly sandy loam; weak medium granular structure; very friable; about 15 percent, by volume, rounded chert and quartz pebbles less than 1 inch in diameter; many fine roots; medium acid; clear wavy boundary.

BA—8 to 14 inches; yellowish red (5YR 4/6) loam; weak fine granular structure; very friable; about 5 percent, by volume, rounded chert and quartz pebbles less than 1 inch in diameter; common fine roots; strongly acid; gradual wavy boundary.

Bt1—14 to 24 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; about 5 percent, by volume, rounded chert and quartz pebbles less than 1 inch in diameter; common fine and medium roots; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt2—24 to 65 inches; red (2.5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; about 5 percent, by volume, rounded chert and quartz pebbles less than 2 inches in diameter; few fine and medium roots; sand grains coated and bridged with clay; strongly acid.

The thickness of solum is 60 inches or more. Depth to bedrock is 6 feet or more. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. It has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 6. The texture is gravelly sandy loam, gravelly loam, sandy loam, or loam. The content of rounded chert or quartz fragments ranges from 5 to 20 percent, by volume. The fragments generally are less than 4 inches in diameter.

The BA horizon, if present, is less than 8 inches thick. It has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is loam, sandy loam, or clay loam. The content of rounded chert or quartz fragments is 10 percent or less, by volume. The fragments generally are less than 4 inches in diameter.

The Bt horizon extends to a depth of more than 60 inches. It has hue of 5YR or 2.5YR, value of 4 to 6, and chroma of 6 or 8. The lower part of the Bt horizon has hue of 2.5YR, value of 3, and chroma of 6. Mottles in shades of red, yellow, or brown range from none to many. The texture of the Bt horizon is sandy clay loam or clay loam. The content of rounded or angular fragments is 10 percent or less, by volume. The fragments generally are less than 4 inches in diameter. In some pedons, the Bt horizon is clay below a depth of about 40 inches.

Bodine Series

The Bodine series consists of deep, somewhat excessively drained, moderately rapidly permeable soils that formed in residuum weathered from chert and cherty limestone. The Bodine soils are on moderately steep or steep uplands and ridges. The slope ranges from 15 to 40 percent.

Bodine soils are geographically associated with Lobelville, Minvale, and Nella soils. Lobelville soils are on flood plains adjacent to the Bodine soils. They are more poorly drained and have less chert fragments than Bodine soils. Minvale and Nella soils are on similar landforms as the Bodine soils but have less chert fragments.

Typical pedon of Bodine cherty loam, in a wooded area of Minvale-Nella-Bodine association, steep; about 4 miles southwest of Pell City, 1,400 feet north of the southeast corner of sec. 18, T. 17 S., R. 3 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) cherty loam; weak fine granular structure; very friable; about 30 percent, by volume, angular chert pebbles; common fine and medium roots; very strongly acid; clear smooth boundary.

BE—6 to 12 inches; brown (7.5YR 5/4) very cherty loam; weak medium subangular blocky structure; friable 40 percent, by volume, angular chert pebbles; common fine and medium roots; very strongly acid; gradual wavy boundary.

Bt1—12 to 17 inches; dark brown (7.5YR 4/4) very cherty loam; weak medium subangular blocky structure; friable; 45 percent, by volume, angular chert pebbles; common fine roots; thin distinct discontinuous clay films on faces of most peds; strongly acid; gradual wavy boundary.

Bt2—17 to 60 inches; strong brown (7.5YR 5/6) very cherty clay loam; moderate medium subangular blocky structure; friable; 40 percent, by volume, angular chert pebbles and cobbles; few fine roots; thin discontinuous distinct clay films on faces of most peds; very strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is 6 feet or more. Reaction ranges from extremely acid to strongly acid.

The A horizon is 3 to 8 inches thick. It has hue of 2.5Y or 10YR, value of 3 or 4; and chroma of 2 to 4. The texture is cherty loam, cherty silt loam, very cherty loam, or very cherty silt loam. The content of angular chert fragments ranges from 20 to 60 percent, by volume. The fragments generally are less than 6 inches in diameter.

The BE horizon, if present, is less than 7 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is cherty loam, cherty silt loam, very cherty loam, or very cherty silt loam. The content of angular chert fragments ranges from 35 to 80 percent, by volume. The fragments generally are less than 6 inches in diameter.

The Bt horizon extends to a depth of more than 60 inches. It has hue of 10YR to 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is cherty silt loam, cherty loam, cherty clay loam, cherty silty clay loam, very cherty loam, or very cherty clay loam. The content of chert fragments ranges from 35 to 80 percent. The fragments generally are less than 10 inches in diameter.

Cane Series

The Cane series consists of deep, moderately well drained, slowly permeable soils that formed in loamy alluvium and colluvium. The Cane soils are on colluvial fans, foot slopes, toe slopes, and stream terraces. The slope ranges from 2 to 12 percent.

Cane soils are geographically associated with Allen, Minvale, Tanyard, Townley, and Wax soils. Allen soils are on similar land forms as the Cane soils. They are better drained than the Cane soils and do not have a fragipan. Minvale and Townley soils are on uplands adjacent to Cane soils. Minvale soils are better drained than Cane soils and do not have a fragipan. Townley soils have a clayey subsoil that is moderately deep to shale bedrock. Tanyard and Wax soils are on flood plains adjacent to Cane soils. These soils have a redder Bt horizon than the Cane soils.

Typical pedon of Cane loam, 8 to 12 percent slopes, in a pasture 10 miles southeast of Ashville, 1,345 feet north and 2,400 feet west of the southeast corner of sec. 17, T. 15 S., R. 3 E.

Ap—0 to 5 inches; brown (7.5YR 4/4) loam; weak fine granular and weak fine subangular blocky structure; friable; many fine roots; 15 percent, by volume, chert and quartzite pebbles; medium acid; clear smooth boundary.

Bt1—5 to 10 inches; yellowish red (5YR 4/8) loam; many medium faint brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; 5 percent, by volume, chert pebbles; brown mottles (25 percent, by volume) from the Ap horizon, mixed by plowing; strongly acid; gradual wavy boundary.

Bt2—10 to 25 inches; yellowish red (5YR 4/8) loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; sand grains coated and bridged with clay; 5 percent, by volume, chert and quartzite pebbles; strongly acid; clear wavy boundary.

Bx1—25 to 37 inches; yellowish red (5YR 4/8) sandy clay loam; common medium distinct very pale brown (10YR 7/4) mottles; weak coarse prismatic parting to moderate coarse platy and moderate medium subangular blocky structure; firm; compact and brittle; many fine pores; thin patchy faint clay films on faces of peds; friable, very pale brown mottles less than 33 millimeters in horizontal dimensions, fill voids around yellowish red prisms; 5 percent, by volume, chert fragments and quartzite pebbles; very strongly acid; clear smooth boundary.

Bx2—37 to 62 inches; red (2.5YR 4/8) sandy clay loam; common medium prominent light gray (10YR 7/1) mottles; weak coarse prismatic parting to moderate coarse platy and moderate medium subangular blocky structure; firm; compact and brittle; many fine pores; thin patchy faint clay films on faces of peds; friable, light gray mottles less than 3 millimeters in horizontal dimensions, fill voids around red prisms; 5 percent, by volume, chert and quartzite pebbles; strongly acid.

Depth to bedrock and the thickness of the solum are more than 60 inches. Depth to the fragipan is 20 to 35 inches. Reaction is medium acid to very strongly acid throughout except where limed. Some part of the solum contains more than 5 percent, by volume, coarse fragments of chert and/or quartzite.

The A horizon is 3 to 10 inches thick. It has hue of 10YR to 5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have an A horizon that is less than 7 inches thick. It has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 3 or 4. The A horizon is loam, sandy loam, fine sandy loam, or the gravelly analogs of those textures.

The Bt horizon is 12 to 30 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is loam, silt loam, silty clay loam, clay loam, or sandy clay loam. The content of coarse fragments ranges from 0 to 15 percent, by volume.

The Bx horizon is 18 to more than 40 inches thick. It has hue of 10YR to 2.5YR, value of 3 to 6, and chroma of 5 to 8. It has common to many friable to very friable mottles in shades of red, brown, yellow, and gray. In some pedons, it is mottled in shades of red, brown, yellow, and gray. The texture is loam, silt loam, silty clay loam, clay loam, or sandy clay loam. The content of coarse fragments ranges from 0 to 15 percent, by volume.

Some pedons have a BC horizon within 60 inches of the surface and a C horizon below a depth of about 60 inches. Hue, value, chroma, and texture ranges are similar to those in the Bx horizon.

Choccolocco Series

The Choccolocco series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium. The Choccolocco soils are on flood

plains and stream terraces. The slope ranges from 0 to 2 percent.

Choccolocco soils are geographically associated with Mooreville, Holston, Tanyard, Toccoa, and Waynesboro soils. Mooreville and Tanyard soils are on lower landforms than Choccolocco soils. They also are more poorly drained. Holston and Waynesboro soils are on uplands adjacent to Choccolocco soils. Holston and Waynesboro soils do not flood. Toccoa soils are on similar landforms as Choccolocco soils but have less clay.

Typical pedon of Choccolocco silt loam, 0 to 2 percent slopes, in a cultivated field 5 miles south of Ragland, 900 feet north and 1,000 feet east of the southwest corner of sec. 29, T. 15 S., R 5 E.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; very friable; few fine roots; common fine flakes of mica; medium acid; clear smooth boundary.

Bt1—6 to 22 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; common fine flakes of mica; medium acid; gradual wavy boundary.

Bt2—22 to 42 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few medium roots; thin patchy faint clay films on faces of peds; common fine flakes of mica; medium acid; gradual wavy boundary.

Bt3—42 to 56 inches; brown (10YR 4/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), light yellowish brown (10YR 6/4), brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable; few medium roots; thin patchy faint clay films on faces of peds; common fine flakes of mica; strongly acid; clear smooth boundary.

BC—56 to 72 inches; brown (10YR 4/4) sandy clay loam; common medium distinct pale brown (10YR 6/3), yellowish brown (10YR 5/6), dark brown (10YR 3/3) mottles; weak fine subangular blocky structure; very friable; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 48 to more than 60 inches. Depth to bedrock is more than 6 feet. Reaction is strongly acid or medium acid.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. The texture is silt loam or loam.

The Bt horizon is 40 to 60 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is silty clay loam, clay loam, or loam.

Most pedons have a BC horizon or a C horizon within 60 inches of the surface. Hue, value, and chroma ranges are similar to those in the Bt horizon. The texture is loam or sandy loam.

Conasauga Series

The Conasauga series consists of moderately deep, moderately well drained, slowly permeable soils that formed in residuum weathered from interbedded shale or shaly limestone. The Conasauga soils are on uplands. The slope ranges from 1 to 15 percent.

Conasauga soils are geographically associated with Firestone, Gaylesville, Minvale, and Tanyard soils. Firestone soils are on similar landforms as Conasauga soils but have more clay and are better drained. Gaylesville and Tanyard soils are on flood plains adjacent to Conasauga soils and are deep to bedrock. Minvale soils are on higher landforms than the Conasauga soils and are deep to bedrock.

Typical pedon of Conasauga silt loam, in a pastured area of Conasauga and Firestone silt loams, 1 to 8 percent slopes, 2 miles west of Ashville, 1,500 feet north and 400 feet east of the southwest corner of sec. 11, T. 14 S., R 3 E.

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

Bt1—4 to 16 inches; strong brown (7.5YR 5/6) silty clay; moderate medium subangular blocky structure; firm; many fine and medium roots; thin patchy distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—16 to 24 inches; yellowish brown (10YR 5/6) silty clay; commmon medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; 10 percent, by volume, shale channers less than 2 inches along longest axis; thin patchy distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Cr—24 to 60 inches; highly weathered, horizontally bedded, fractured shale; rock structure; neutral.

The thickness of the solum and depth to bedrock are 20 to 40 inches. Reaction ranges from extremely acid to medium acid in the solum and from medium acid to mildly alkaline in the bedrock and immediately above the bedrock.

The A horizon is 1 to 7 inches thick. It has hue of 2.5Y or 10YR, value of 3 to 5, and chroma of 2 to 4. Value and chroma are 3 or less where the thickness of the A horizon is 6 inches or less. The texture is loam or silt loam.

The BE or BA horizon, if present, is less than 6 inches thick. It has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4 or 6. The texture is silt loam or silty clay loam.

The Bt horizon is 12 to 28 inches thick. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Mottles are in shades of red, yellow, or brown. Most pedons have mottles in shades of gray below a depth of

about 15 inches. The texture of the Bt horizon is silty clay or clay.

The BC, CB, or C horizon, if present, is less than 8 inches thick. These horizons have the same hue, value, chroma, and texture ranges as those in the Bt horizon.

The Cr horizon is horizontally bedded shale or interbedded shale and shaly limestone.

Dewey Series

The Dewey series consists of deep, well drained, moderately permeable soils that formed in residuum weathered from limestone. The Dewey soils are on uplands. The slope ranges from 2 to 30 percent.

Dewey soils are geographically associated with Emory, Lobelville, Minvale, and Wax soils. Emory soils are in depressional areas adjacent to Dewey soils. They have less clay than Dewey soils. Lobelville and Wax soils are on flood plains adjacent to Dewey soils, but they have less clay and more chert fragments. Minvale soils are on similar landforms as Dewey soils but have more chert fragments.

Typical pedon of Dewey loam, 8 to 15 percent slopes, in a cultivated area 5 miles south of Pell City, 1,640 feet south and 1,800 feet east of the northwest corner of sec. 32, T. 17 S., R 4 E.

Ap—0 to 4 inches; brown (7.5YR 4/4) loam; weak fine granular structure; very friable; few fine black concretions; many fine roots; medium acid; clear wavy boundary.

Bt1—4 to 7 inches; red (2.5YR 4/8) silty clay loam; weak medium subangular blocky structure; friable; many fine roots; strongly acid; clear wavy boundary.

Bt2—7 to 23 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; few fine and medium roots; thin patchy distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—23 to 32 inches; red (2.5YR 4/6) clay; few fine prominent reddish yellow (7.5YR 6/8) mottles; strong medium subangular blocky structure; firm; few fine roots; thin patchy distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt4—32 to 65 inches; red (2.5YR 4/6) clay; many medium prominent reddish yellow (7.5YR 7/8) mottles; strong medium subangular blocky structure; firm; 5 percent, by volume, fine chert pebbles 2 to 12 millimeters in diameter; thin patchy distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Depth to bedrock is more than 6 feet. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Angular chert or quartz fragments that are less than 4 inches across is less than 10 percent, by volume, in the upper part of the solum and less than 15 percent, by volume, below a depth of about 40 inches.

The A horizon is 3 to 9 inches thick. It has hue of 7.5YR to 2.5YR, value of 3 to 5, and chroma of 4 to 6. The texture is loam or silt loam. If the A horizon is severely eroded, the texture is silty clay loam, or clay.

The BE horizon, if present, is less than 6 inches thick. It has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8. The texture is loam, clay loam, or silty clay loam.

The Bt horizon extends to a depth of more than 60 inches. It has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 6 or 8. Below a depth of about 30 inches, most pedons have many mottles in shades of yellow or brown or a mottled red, brown, or yellow matrix. The texture is clay or silty clay. In pedons that do not have a BE horizon, the upper part of the Bt horizon has the same thickness, hue, value, chroma, and texture ranges as those in the BE horizon.

Emory Series

The Emory series consists of deep, well drained, moderately permeable soils that formed in silty local alluvium. The Emory soils are in upland drainageways or depressions. The slope ranges from 0 to 2 percent.

Emory soils are geographically associated with Dewey and Mooreville soils. Dewey soils are on higher landforms than Emory soils. They have more clay than the Emory soils and are not subject to ponding. Mooreville soils are on flood plains adjacent to Emory soils. The Mooreville soils are moderately well drained.

Typical pedon of Emory silt loam, 0 to 2 percent slopes, in a cultivated field 2 miles southeast of Pell City, 2,100 feet south and 300 feet west of the northeast corner of sec. 8, T. 17 S., R 4 E.

Ap—0 to 11 inches; dark reddish brown (5YR 3/4) silt loam; weak fine granular structure; very friable; few fine roots; slightly acid; clear smooth boundary.

Bw—11 to 29 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable, few fine roots; medium acid; clear smooth boundary.

Ab—29 to 39 inches; dark reddish brown (5YR 3/3) silt loam; weak fine granular structure; very friable; few fine roots; medium acid; clear wavy boundary.

Btb—39 to 65 inches; dark red (2.5YR 3/6) silty clay loam; moderate medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; strongly acid.

The thickness of the solum is more than 60 inches. Depth to bedrock is more than 6 feet. The thickness of the local alluvium above the buried solum is 20 to 30 inches. Reaction is strongly acid or medium acid throughout except where the surface layer has been limed.

The A horizon is 7 to 12 inches thick. It has hue of 7.5YR or 5YR, value of 3, and chroma of 3 or 4. The texture is silt loam.

The Bw horizon is 14 to 24 inches thick. It has hue of 5YR, value of 3 or 4, and chroma of 4. The texture is silt loam or silty clay loam.

The Ab horizon is 6 to 12 inches thick. It has hue of 5YR, value of 3 or 4, and chroma of 2 to 4. The texture is silt loam.

The Btb horizon extends to a depth of more than 60 inches. It has hue of 5YR or 2.5YR, value of 3 to 6, and chroma of 4 to 8. The texture is clay loam or silty clay loam

Firestone Series

The Firestone series consists of moderately deep, well drained, slowly permeable soils that formed in residuum weathered from shale. The Firestone soils are on uplands. The slope ranges from 2 to 15 percent.

Firestone soils are geographically associated with Conasauga, Gaylesville, Minvale, and Tanyard soils. Conasauga soils are on similar landforms as Firestone soils, but they have less clay and are more poorly drained than the Firestone soils. Gaylesville and Tanyard soils are on flood plains adjacent to Firestone soils. These soils are deep to bedrock. Minvale soils are on higher landforms than Firestone soils and are deep to bedrock.

Typical pedon of Firestone silt loam, in a wooded area of Conasauga and Firestone silt loams, 1 to 8 percent slopes, 3 miles west of Ashville, 1,970 feet north and 2,000 feet west of the southeast corner of sec. 10, T. 14 S., R 3 E.

A—0 to 3 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; few fine roots; strongly acid; clear wavy boundary.

BA—3 to 6 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

Bt1—6 to 25 inches; brownish yellow (10YR 6/8) clay; strong medium subangular blocky structure; firm; very plastic and very sticky; few fine roots; thin discontinuous distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—25 to 33 inches; brownish yellow (10YR 6/8) silty clay; common medium distinct light gray (10YR 7/2) and pinkish gray (7.5YR 7/2) mottles; strong medium subangular blocky structure; firm; very plastic and very sticky; few fine roots; 15 to 20 percent, by volume, shale channers; thin discontinuous distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Cr—33 to 60 inches; partially weathered, fractured shale.

The thickness of the solum and depth to bedrock is 20 to 40 inches. Reaction is very strongly acid or strongly acid in the solum and ranges from medium acid to mildly alkaline in the bedrock and immediately above the bedrock.

The A horizon is 2 to 7 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Value and chroma are 3 or less where the thickness of the A horizon is 6 inches or less. The texture is loam or silt loam.

The BE or BA horizon, if present, is less than 6 inches thick. It has hue of 2.5Y to 7.5YR, value of 5 or 6, and chroma of 4 or 6. The texture is silt loam or silty clay loam

The Bt horizon is 12 to 28 inches thick. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Mottles are in shades of red, yellow, or brown. Most pedons have mottles in shades of gray below a depth of about 20 inches. The texture of the Bt horizon is dominantly clay but includes silty clay in the lower part of the horizon.

The BC, CB, or C horizon, if present, is less than 8 inches thick. These horizons have the same hue, value, and chroma ranges as those in the Bt horizon. The texture is silty clay or clay.

The Cr horizon is horizontally bedded shale.

Gaylesville Series

The Gaylesville series consists of deep, poorly drained or somewhat poorly drained, slowly permeable soils that formed in clayey alluvium. The Gaylesville soils are on flood plains. The slope ranges from 0 to 2 percent.

Gaylesville soils are geographically associated with Conasauga, Firestone, Minvale, Tanyard, Tasso, and Townley soils. These geographically associated soils are better drained than the Gaylesville soils. Conasauga, Firestone, Minvale, and Townley soils are on uplands adjacent to the Gaylesville soils. Tanyard soils are on slightly higher flood plains than the Gaylesville soils. Tasso soils are on colluvial fans, foot slopes, toe slopes, and stream terraces adjacent to Gaylesville soils.

Typical pedon of Gaylesville silt loam, 0 to 2 percent slopes, in a wooded area 2 miles west of Logan Martin Dam, 1,350 feet south and 1,300 feet west of the northeast corner of sec. 31, T. 18 S., R. 3 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

BE—5 to 11 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; less than 2 percent, by volume, fine chert pebbles; few fine roots; few thin patchy

faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg1—11 to 25 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; 2 percent, by volume, fine chert pebbles; few medium roots; thin patchy distinct clay films on faces of peds; very strongly acid.

Btg2—25 to 60 inches; gray (N 5/0) clay; common medium distinct yellowish brown (10YR 5/8) mottles; strong medium subangular blocky structure; firm; 2 percent, by volume, fine chert pebbles; few medium roots; thin patchy distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Depth to bedrock is more than 6 feet. Reaction is very strongly acid or strongly acid.

The A horizon is 3 to 7 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The texture is loam, silt loam, or silty clay loam.

The BE horizon, if present, is less than 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2; or it has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. In some pedons, it is mottled in shades of gray, red, or brown. The texture of the BE horizon is silt loam or silty clay loam.

The Bt horizon extends to a depth of more than 60 inches. It is neutral with value of 5 to 7; or it has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2; or it is mottled in varying shades of red, gray, yellow, or brown. The texture is silty clay loam, silty clay, or clay. In some pedons, if a BE horizon is not present, the upper part of the Bt horizon has the same hue, value, chroma, and texture ranges as those in the BE horizon.

Holston Series

The Holston series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium and colluvium. The Holston soils are on stream terraces, foot slopes, and upland benches. The slope ranges from 2 to 6 percent.

Holston soils are geographically associated with Allen, Choccolocco, Minvale, Waynesboro, and Wax soils. Allen, Minvale, and Waynesboro soils are on similar landforms as the Holston soils but have a redder subsoil. Choccolocco soils are on slightly lower landforms than Holston soils and have more silt. Wax soils are on flood plains adjacent to Holston soils. Wax soils are moderately well drained.

Typical pedon of Holston sandy loam, 2 to 6 percent slopes, in a cultivated field about 3 miles south of Ragland, 2,600 feet south and 2,600 feet west of the northeast corner of sec. 31 T., 15 S., R. 5 E.

Ap—0 to 7 inches; brown (10YR 4/3) sandy loam, weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Bt1—7 to 17 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt2—17 to 29 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—29 to 38 inches; yellowish brown (10YR 5/6) clay loam; few medium distinct yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; thin patchy faint clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt4—38 to 60 inches; yellowish red (5YR 4/6) clay loam; few medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; thin patchy distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is 6 feet or more. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. The texture is sandy loam or loam. The content of rounded chert or quartz fragments ranges from 0 to 5 percent, by volume. The fragments generally are less than 2 inches in diameter.

The BE horizon, if present, is less than 8 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 4 to 8. The texture is loam or sandy loam, or clay loam. The content of rounded chert or quartz fragments ranges from 0 to 5 percent, by volume. The fragments generally are less than 2 inches in diameter.

The Bt horizon extends to a depth of more than 60 inches and has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 6 or 8. The lower part of the Bt horizon has hue of 5YR, value of 4 to 6, and chroma of 6. This horizon has none to many mottles in shades of red, yellow, or brown. The texture is loam, sandy clay loam, or clay loam. The content of rounded or angular fragments ranges from 0 to 10 percent, by volume. The fragments generally are less than 4 inches in diameter. In some pedons, the Bt horizon is silty clay loam below a depth of about 40 inches.

Lobelville Series

The Lobelville series consists of deep, moderately well drained, moderately permeable soils that formed in

cherty, loamy alluvium. The Lobelville soils are on flood plains. The slope ranges from 0 to 2 percent.

Lobelville soils are geographically associated with Bodine, Mooreville, Dewey, Minvale, and Wax soils. Bodine, Dewey, and Minvale soils are on uplands adjacent to Lobelville soils and are better drained. Mooreville soils are on similar landforms as Lobelville soils but have less chert. Wax soils are on similar or slightly higher landforms than Lobelville soils and have a fragipan.

Typical pedon of Lobelville cherty silt loam, 0 to 2 percent slopes, in a wooded area 2 miles northeast of Riverside, 850 feet south and 375 feet east of the northeast corner of sec. 24, T. 16 S., R 4 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) cherty silt loam; weak fine granular structure; very friable; 15 percent, by volume, chert pebbles less than 1 inch in diameter; few fine roots; strongly acid; clear wavy boundary.

Bw1—4 to 14 inches; brown (10YR 4/3) cherty loam; weak fine granular structure; very friable; 20 percent, by volume, chert pebbles less than 1 inch in diameter; few fine roots; strongly acid; clear wavy boundary.

Bw2—14 to 23 inches; mottled; dark grayish brown (10YR 4/2), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/8) cherty clay loam; weak medium subangular blocky structure; friable; 15 percent, by volume, chert pebbles less than 2 inches in diameter; few fine roots; strongly acid; gradual wavy boundary.

Bw3—23 to 55 inches; mottled, dark grayish brown (10YR 4/2), brown (10YR 4/3), dark yellowish brown (10YR 4/4), and light brownish gray (10YR 6/2) cherty clay loam; weak medium subangular blocky structure; friable; 30 percent, by volume, chert pebbles and cobbles up to 4 inches in diameter; strongly acid; abrupt wavy boundary.

Cg—55 to 60 inches; gray (10YR 5/1) very cherty loam; many coarse distinct dark yellowish brown (10YR 4/4) mottles; massive; 50 percent, by volume, chert pebbles and cobbles up to 4 inches in diameter; strongly acid.

The thickness of the solum ranges from 44 to 60 inches. Depth to bedrock is 6 feet or more. Reaction ranges from very strongly acid to medium acid. Chert pebbles that are less than 3 inches in diameter range from 10 to 30 percent, by volume, in the upper 40 inches of the soil. Chert fragments that are less than 4 inches in diameter range from 20 to 60 percent, by volume, below 40 inches of the soil.

The A horizon is 3 to 8 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. The texture is cherty loam or cherty silt loam.

The upper part of the Bw horizon is 8 to 18 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 3 to 6. The texture is cherty loam, cherty clay loam, or cherty silty clay loam. The lower part of the Bw horizon is 20 to 40 inches thick. It is mottled in shades of gray, yellow, or brown; or it has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. This horizon has common to many brown or yellow mottles. The texture is very cherty loam, cherty clay loam, or cherty loam.

The C horizon extends to a depth of more than 60 inches. It has the same hue, value, chroma, and texture ranges as those in the lower part of the Bw horizon.

Minvale Series

The Minvale series consists of deep, well drained, moderately permeable soils that formed in loamy residuum weathered from cherty limestone. The Minvale soils are on uplands. The slope ranges from 2 to 45 percent.

Minvale soils are geographically associated with Allen, Bodine, Cane, Conasauga, Dewey, Firestone, Gaylesville, Holston, Lobelville, Mooreville, Nella, Tasso, Townley, and Wax soils. Allen, Cane, Holston, and Tasso soils are on slightly lower landforms than Minvale soils and have less chert fragments. Minvale soils and Bodine and Nella soils are on similar landforms. Bodine soils have more chert fragments than the Minvale soils, and Nella soils have rounded pebbles and more sand. Unlike the Minvale soils, Gaylesville, Mooreville, Lobelville, and Wax soils are on flood plains. These soils are more poorly drained than Minvale soils. Conasauga, Dewey, Firestone, and Townley soils are on similar landforms as Minvale soils but contain less chert and more clay.

Typical pedon of Minvale cherty loam, 8 to 15 percent slopes, in a wooded area 1 mile north of Riverside, 920 feet south and 1,200 feet east of the northwest corner of sec. 26, T. 16 S., R. 4 E.

A—0 to 4 inches; brown (10YR 4/3) cherty loam; weak fine granular structure; very friable; 15 percent, by volume, chert pebbles less than 3 inches in diameter; many fine roots; strongly acid; clear smooth boundary.

BE—4 to 9 inches; yellowish brown (10YR 5/6) cherty loam; weak fine granular and weak medium subangular blocky structure; friable; 20 percent, by volume, chert pebbles less than 3 inches in diameter; many fine and medium roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt1—9 to 16 inches; strong brown (7.5YR 5/6) cherty silty clay loam; weak medium subangular blocky structure; friable; 20 percent, by volume, chert pebbles less than 3 inches in diameter and few chert fragments more than 3 inches; few fine and medium roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt2—16 to 24 inches; yellowish red (5YR 5/8) cherty silty clay loam; weak medium subangular blocky structure; friable; 20 percent, by volume, chert pebbles less than 3 inches in diameter and few chert fragments more than 3 inches; few fine roots; thin patchy faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—24 to 65 inches; yellowish red (5YR 5/8) cherty silty clay loam; common medium distinct yellowish brown (10YR 5/8), pink (7.5YR 7/4), and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; 30 percent, by volume, chert pebbles less than 3 inches in diameter and few chert fragments more than 3 inches; thin patchy faint clay films on faces of peds; strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is 6 feet or more. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. In all horizons, chert pebbles range from 15 to 35 percent, by volume, and chert fragments that are larger than 3 inches are less than 5 percent, by volume.

The A horizon is 3 to 10 inches thick. It has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. The texture is cherty silt loam or cherty loam.

The BE horizon is less than 10 inches thick. It has hue of 10YR to 5YR, value of 4 or 5, and chroma of 6 or 8. The texture is cherty silt loam or cherty silty clay loam.

The upper part of the Bt horizon is 10 to 25 inches thick. It has the same hue, value, and chroma ranges as those in the BE horizon. The texture is cherty silt loam or cherty silty clay loam. The lower part of the Bt horizon extends to a depth of more than 60 inches. It has the same hue, value, and chroma ranges as those in the BE horizon. This horizon has few to many mottles in shades of brown or yellow. The texture is cherty silty clay loam, cherty silty clay, cherty loam, and cherty clay.

Mooreville Series

The Mooreville series consists of deep, moderately well drained, moderately permeable soils that formed in loamy alluvium. The Mooreville soils are on flood plains. The slope ranges from 0 to 2 percent.

Mooreville soils are geographically associated with Allen, Choccolocco, Lobelville, Minvale, Toccoa, and Wax soils. Mooreville soils are adjacent to Allen and Minvale soils. Allen and Minvale soils are on uplands and are better drained than the Mooreville soils. Choccolocco, Toccoa, and Wax soils are on slightly higher landforms than Mooreville soils and are better drained. The Wax soils have more chert fragments than Mooreville soils. Lobelville soils are on similar landforms as the Mooreville soils but have more chert fragments.

Typical pedon of Mooreville silt loam, 0 to 2 percent slopes, in a wooded area 12 miles southeast of Pell City, 1,320 feet south and 700 feet west of the northeast corner of sec. 6, T. 19 S., R. 3 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

Bw1—5 to 11 inches; brown (10YR 4/3) silty clay loam; few medium distinct grayish brown mottles; weak fine subangular blocky structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

Bw2—11 to 24 inches; mottled, grayish brown (10YR 5/2), dark yellowish brown (10YR 4/2), and brown (7.5YR 4/4) silty clay loam; weak fine granular and weak medium subangular blocky structure; friable; many fine and medium roots; medium acid; clear smooth boundary.

Bg1—24 to 47 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellow (10YR 7/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular block structure; friable; common fine black concretions; few fine and medium roots; slightly acid; gradual wavy boundary.

Bg2—47 to 60 inches; mottled, yellow (10YR 7/8), light brownish gray (10YR 6/2), and grayish brown (10YR 5/2) clay loam; weak medium subangular blocky structure; friable; common fine black concretions; slightly acid.

The thickness of the solum ranges from 48 inches to more than 60 inches. Depth to bedrock is more than 6 feet. Reaction is very strongly acid or strongly acid.

The A horizon is 4 to 9 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The texture is loam or silt loam.

The upper part of the B horizon is 9 to 23 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 3 or 4; or it is mottled in shades of red, yellow, brown, or gray. The texture is loam, clay loam, or silty clay loam. The lower part of the B horizon is 30 to more than 50 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 2; or it is mottled in shades of gray, yellow, and brown. The texture is loam, sandy clay loam, silty clay loam, or clay loam. The content of black or dark brown concretions is 10 percent or less, by volume.

Some pedons have a BC horizon or a C horizon within a depth of 60 inches of the surface. Hue, value, chroma, and texture ranges are similar to those in the lower part of the B horizon.

Nauvoo Series

The Nauvoo series consist of deep, well drained, moderately permeable soils that formed in loamy residuum weathered from sandstone or interbedded sandstone and shale. The Nauvoo soils are on the

upland plateaus, ridges, hillsides, and benches. The slope ranges from 2 to 35 percent.

Nauvoo soils are geographically associated with Allen, Nella, and Townley soils and areas of rock outcrop. Allen soils are on lower landforms than Nauvoo soils and are deeper to bedrock. Nella and Townley soils are on similar landforms as Nauvoo soils. Nella soils are deeper to bedrock than Nauvoo soils and Townley soils have more clay.

Typical pedon of Nauvoo sandy loam, 2 to 6 percent slopes, in a cultivated field 2 miles east of Steele, 1,400 feet south and 2,000 feet east of the northwest corner of sec. 5, T. 13 S., R 4 E.

Ap—0 to 7 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; few fine roots; very strongly acid; clear smooth boundary.

Bt1—7 to 18 inches; yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; clay bridges and coatings on sand grains; very strongly acid; gradual wavy boundary.

Bt2—18 to 35 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

CB—35 to 41 inches; yellowish red (5YR 5/8) sandy loam; massive; friable; thin discontinuous faint clay films on vertical cracks; very strongly acid; abrupt wavy boundary.

Cr—41 to 60 inches; yellowish red (5YR 5/6); level bedded; massive; highly weathered sandstone bedrock; can be dug with a spade.

The thickness of the solum ranges from 30 to 45 inches. Depth to weathered bedrock is 40 to 60 inches. Sandstone, shale, or quartz fragments that are less than 5 inches in diameter are less than 15 percent, by volume, in all horizons. Reaction is very strongly acid or medium acid throughout except where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The texture is sandy loam, fine sandy loam, or sandy clay loam.

The BE horizon, if present, is less than 10 inches thick. It has hue of 10YR to 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is sandy loam, fine sandy loam, or sandy clay loam.

The Bt horizon is 17 to 33 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is sandy clay loam or clay loam.

The BC, CB, or C horizon, if present, is less than 10 inches thick. These horizons have hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is fine sandy loam, sandy loam, loam, or sandy clay loam.

The Cr horizon extends to a depth of more than 6 feet. It is level bedded, highly weathered sandstone or interbedded sandstone and shale in shades of red, yellow, or gray.

Nella Series

The Nella series consists of deep, well drained, moderately permeable soils that formed in gravelly and loamy alluvium and colluvium. The Nella soils are on stream terraces, foot slopes, and hillsides. The slope ranges from 4 to 45 percent.

Nella soils are geographically associated with and are on similar landforms as Allen, Bodine, Minvale, Nauvoo, Townley, and Waynesboro soils. Allen, Nauvoo, Townley, and Waynesboro soils contain less coarse fragments than Nella soils. Bodine and Minvale soils have chert fragments and contain less sand than the Nella soils.

Typical pedon of Nella gravelly sandy loam, 4 to 12 percent slopes, in a wooded area of Minvale-Nella-Townley association, steep, 5 miles south of Ashville, 700 feet south and 400 feet west of the northeast corner of sec. 31, T. 14 S., R. 4 E.

Ap—0 to 4 inches; brown (10YR 4/3) gravelly sandy loam; weak fine granular structure; very friable; 20 percent, by volume, sandstone pebbles and cobbles less than 4 inches in diameter; many fine and medium roots; strongly acid; clear smooth boundary.

E—4 to 9 inches; yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; very friable; 20 percent, by volume, sandstone pebbles and cobbles less than 5 inches in diameter; many fine and medium roots; strongly acid; clear wavy boundary.

BE—9 to 14 inches; strong brown (7.5YR 5/6) gravelly loam; weak medium subangular blocky structure; friable; 20 percent, by volume, sandstone pebbles and cobbles less than 4 inches in diameter; many fine and medium roots; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt1—14 to 24 inches; yellowish red (5YR 5/6) gravelly clay loam; moderate medium subangular blocky structure; friable; 20 percent, by volume, sandstone pebbles and cobbles less than 4 inches in diameter; many fine roots; thin patchy faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—24 to 43 inches; red (2.5YR 5/8) gravelly clay loam; moderate medium subangular blocky structure; friable; 25 percent, by volume, sandstone pebbles and cobbles less than 4 inches in diameter; common fine roots; thin patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—43 to 70 inches; red (2.5YR 4/8) gravelly clay loam; common medium distinct reddish yellow (5YR

6/8) mottles; moderate medium subangular blocky structure; friable; 20 percent, by volume, sandstone pebbles and cobbles less than 4 inches in diameter; common fine roots; thin patchy distinct clay films on faces of peds; strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is more than 6 feet. Reaction is very strongly acid or strongly acid throughout. In all horizons, sandstone pebbles and cobbles that are less than 6 inches in diameter range from 10 to 35 percent, by volume.

The A horizon is 2 to 6 inches thick. It has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 3 or 4. The texture is gravelly sandy loam and gravelly loam.

The E horizon, if present, is less than 8 inches thick. It has hue of 10YR to 5YR, value of 5 or 6, and chroma of 3 to 8. The texture is gravelly sandy loam or gravelly loam.

The BE horizon, if present, is less than 8 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is gravelly sandy loam, gravelly loam, gravelly sandy clay loam, or cobbly loam.

The Bt horizon extends to a depth of 60 inches or more. It has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 6 or 8. The texture is gravelly sandy clay loam, gravelly clay loam, cobbly sandy clay loam, or cobbly clay loam. In some pedons below a depth of about 40 inches, the Bt horizon is very gravelly or extremely gravelly analogs of the above Bt horizon textures. When naming these map units as Nella, the pedons were considered to be similar, even though this is outside the defined range for the Nella series.

Tanyard Series

The Tanyard series consists of deep, moderately well drained, moderately slowly permeable soils that formed in loamy alluvial sediment. The Tanyard soils are on flood plains. The slope ranges from 0 to 2 percent.

Tanyard soils are geographically associated with Conasauga, Firestone, Gaylesville, Tasso, Townley, and Wax soils. Conasauga, Firestone, and Townley soils are on upland adjacent to Tanyard soils but are more clayey and have shaly bedrock at a depth of less than 40 inches. Gaylesville soils are on low landforms and are more poorly drained than Tanyard soils. Tasso soils are on toe slopes and stream terraces adjacent to Tanyard soils. Tasso soils have a brittle subsoil. Wax soils are on similar landforms as Tanyard soils but have a fragipan.

Typical pedon of Tanyard silt loam, 0 to 2 percent slopes, in a pasture 2.5 miles northwest of Pell City, 500 feet south and 1,520 feet west of the northeast corner of sec. 27, T. 16 S., R. 3 E.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

Bt1—6 to 10 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; few fine roots; medium acid; gradual wavy boundary.

Bt2—10 to 22 inches; yellowish brown (10YR 5/6) loam; common medium distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Bt3—22 to 30 inches; brownish yellow (10YR 6/6) loam; few medium faint light yellowish brown (10YR 6/4) and common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; thin patchy distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Bt4—30 to 59 inches; brownish yellow (10YR 6/6) loam; common medium distinct yellowish brown (10YR 5/8) and common medium distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable; 10 percent, by volume, slightly compact and brittle; thin patchy distinct clay films on faces of peds; medium acid; gradual wavy boundary.

Bt5—59 to 72 inches; mottled, yellowish brown (10YR 5/8), light gray (10YR 7/2), and yellow (10YR 7/6) sandy clay loam; moderate medium subangular blocky structure; very friable; thin discontinuous distinct clay films on faces of peds; neutral.

The thickness of the solum is more than 60 inches. Reaction ranges from very strongly acid to medium acid in the upper part of the solum and ranges from medium acid to neutral below a depth of about 40 inches. Some pedons contain black manganese and iron concretions in the lower part of the B horizon.

The A horizon is 4 to 10 inches thick. It has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4. If the value is less than 3.5, the Ap or A1 horizon will be less than 7 inches thick. The texture is silt loam, loam, or sandy loam.

The BE horizon, if present, is less than 8 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 3 to 6. This horizon has mottles in shades of brown. The texture is loam or silt loam.

The upper part of the Bt horizon extends to a depth of less than 60 inches. It has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. In the upper 10 inches, this horizon is mottled in shades of brown and yellow and in shades of gray. The texture is loam, silt loam, clay loam, or silty clay loam. The content of silt is more than 30 percent. The lower part of the Bt horizon generally extends to a depth of 60 inches or more. It has hue of 10YR and 2.5Y, value of 4 to 6, and chroma of 2 to 8; or it is mottled in shades of brown, gray, red, or yellow. The

texture is loam, sandy clay loam, clay loam, or sandy clay. In some pedons, subhorizons are brittle and compact in about 10 to 30 percent of the mass in the lower part of the Bt horizon.

Some pedons have a BC horizon within 60 inches of the surface. The hue, value, chroma, and texture ranges are the same as those in the lower part of the Bt horizon.

Tasso Series

The Tasso series consists of deep, moderately well drained or well drained, moderately permeable soils that formed in loamy alluvium and colluvium. The Tasso soils are on colluvial fans, foot slopes, toe slopes, and stream terraces. The slope ranges from 4 to 12 percent.

Tasso soils are geographically associated with Cane, Gaylesville, Minvale, Townley, and Wax soils. Cane soils are on similar landforms as Tasso soils, but they have less coarse fragments and a brittle subsoil in more than 60 percent of its volume. Minvale and Townley soils are on higher landforms than Tasso soils and have a nonbrittle subsoil.

Typical pedon of Tasso sandy loam, 4 to 12 percent slopes, in a wooded area 5 miles north of Ragland, 200 feet east and 2,750 feet north of the southwest corner of sec. 19, 14 S., and R. 5 E.

A—0 to 5 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; 12 percent, by volume, pebbles less than 1 inch in diameter; many fine and medium roots; strongly acid; clear smooth boundary.

Bt—5 to 25 inches; yellowish brown (10YR 5/6) loam; moderate medium granular and weak medium subangular blocky structure; friable; 15 percent, by volume, sandstone and chert pebbles less than 2 inches in diameter; many fine roots; sand grains on faces of peds coated and bridged with clay; strongly acid; clear wavy boundary.

2Bt/Bx—25 to 65 inches; 60 percent of mass mottled, yellowish red (5YR 5/6) and pale brown (10YR 6/3) sandy clay loam, 12 to 36 inches horizontal dimension and continuous vertical dimension; moderate medium subangular blocky structure; friable; common fine and medium roots; 10 percent, by volume, sandstone and chert pebbles less than 2 inches in diameter; thin patchy faint clay films on faces of peds; 40 percent of mass mottled, yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) cherty loam, 12 to 20 inches horizontal dimension and continuous vertical dimension; dense, brittle; cemented; weak thick platy structure; few fine roots; 15 percent, by volume, chert pebbles less than 1 inch in diameter; strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is more than 6 feet. Depth to a horizon that is 40 to 60 percent brittle is 19 to 44 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed. Sandstone and chert pebbles and cobbles that are less than 4 inches across range from 2 to 15 percent, by volume, in the A horizon and Bt horizon and range from 10 to 25 percent in the lower horizons.

The A horizon is 2 to 8 inches thick. It has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. The texture is sandy loam or loam.

The E or BE horizon, if present, is less than 8 inches thick. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6. The texture is sandy loam or loam.

The Bt horizon is 10 to 30 inches thick. It has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The texture is loam or clay loam.

The 2Bt/Bx horizon is 20 to more than 30 inches thick. The 2Bt part of this horizon is 40 to 60 percent of the mass. It has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8; or it is mottled in shades of red, brown, or yellow. The texture is sandy clay loam, clay loam, or clay. The Bx part of this horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 8; or it is mottled in shades of gray, yellow, brown, or red. The texture is cherty loam, cherty clay loam, or cherty silty clay loam.

Toccoa Series

The Toccoa series consists of deep, well drained, moderately rapidly permeable soils that formed in stratified, loamy alluvium and fluvium. The Toccoa soils are on flood plains. The slope ranges from 0 to 2 percent.

Toccoa soils are geographically associated with Choccolocco, Holston, Mooreville, and Waynesboro soils. Choccolocco soils are on similar to slightly higher landforms than Toccoa soils and are more clayey. Mooreville soils are on slightly lower landforms and are moderately well drained. Holston and Waynesboro soils are on uplands adjacent to Toccoa soils, and they do not flood.

Typical pedon of Toccoa sandy loam, 0 to 2 percent slopes, in a pasture 14 miles southeast of Pell City, 2,800 feet south and 1,800 feet west of the northeast corner of sec. 6, T. 19 S., R. 3 E.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; many fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

C1—9 to 19 inches; mixed light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) sandy loam; massive; friable; many fine flakes of mica; few fine and medium roots; strongly acid; gradual smooth boundary.

C2—19 to 30 inches; brown (7.5YR 4/4) sandy loam; common medium distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/8) mottles; massive; friable; many fine flakes of mica; few fine and medium roots; strongly acid; gradual smooth boundary.

C3—30 to 40 inches; yellowish brown (10YR 5/8) sandy loam; pockets and strata of light yellowish brown (10YR 6/4) loamy sand; massive; very friable; many fine flakes of mica; few fine roots; medium acid; gradual smooth boundary.

C4—40 to 65 inches; mottled, brown (7.5YR 4/4), strong brown (7.5YR 5/6) sandy loam; pockets and strata of very pale brown (10YR 7/4) loamy sand; massive; friable; many fine flakes of mica; few black stains; strongly acid.

Depth to bedrock is 6 feet or more. Reaction ranges from strongly acid to slightly acid throughout. Flakes of mica range from few to many in all horizons.

The A horizon is 4 to 12 inches thick. It has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. The texture is sandy loam, loam, or fine sandy loam.

The C horizon extends to a depth of more than 60 inches. It has hue of 10YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. The texture is sandy loam that has pockets and strata of loam, loamy sand, and sand.

Townley Series

The Townley series consists of moderately deep, well drained, slowly permeable soils that formed in clayey residuum weathered from shale or interbedded sandstone and shale. The Townley soils are on uplands. The slope ranges from 2 to 40 percent.

Townley soils are geographically associated with Gaylesville, Minvale, Nauvoo, Nella, Tanyard, and Wax soils. Gaylesville, Tanyard, and Wax soils are on flood plains and are more poorly drained than Townley soils. Tasso soils are on foot slopes, toe slopes, and stream terraces adjacent to Townley soils and are deep to bedrock. Townley soils and Minvale, Nauvoo, and Nella soils are on similar landforms. Minvale and Nella soils are deeper to bedrock than Townley soils, and Nauvoo soils have less clay.

Typical pedon of Townley silt loam, 6 to 15 percent slopes, in a wooded area 4 miles southeast of Pell City, 1,000 feet south and 2,300 feet west of the northwest corner of sec. 20, T. 17 S., R. 3 E.

A—0 to 5 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; 10 percent, by volume, shale channers and fine sandstone pebbles; medium acid; clear wavy boundary.

Bt1—5 to 10 inches; yellowish red (5YR 5/8) silty clay; moderate medium subangular blocky structure; firm; few medium and fine roots; 5 to 8 percent, by volume, fine sandstone pebbles and shale channers; thin patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—10 to 20 inches; yellowish red (5YR 5/6) silty clay or clay; moderate medium subangular blocky or strong medium subangular structure; firm; few medium and large roots; 15 percent, by volume, shale channers; thin patchy clay distinct films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—20 to 31 inches; mottled, light brownish gray (10YR 6/2), pinkish gray (7.5YR 7/2), yellowish red (5YR 5/8), red (2.5YR 4/8) silty clay loam; weak medium subangular blocky structure; firm; few medium roots; 25 percent, by volume, shale fragments; very thin patchy faint clay films on faces of peds; very strongly acid; abrupt irregular boundary.

Cr—31 to 60 inches; partially weathered, fractured shale.

The thickness of the solum and depth to shale bedrock range from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout except where the surface layer has been limed.

The A horizon is 2 to 6 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The texture is silt loam, loam, fine sandy loam, gravelly loam, or gravelly fine sandy loam. The content of sandstone and shale fragments ranges from 2 to 35 percent, by volume. The fragments generally are less than 5 inches in diameter.

The Bt horizon is 15 to 30 inches thick. It has hue of 7.5YR to 2.5YR, value of 4 or 5, and chroma of 4 to 8. The texture is clay, silty clay, or silty clay loam. The content of shale fragments ranges from 5 to 15 percent, by volume, in the upper part of the Bt horizon and ranges from 10 to 30 percent, by volume, in the lower part. The fragments generally are 3 inches or less along the longest axis.

The BC or C horizon, if present, is less than 10 inches thick. It is mottled in shades of gray, brown, red, or yellow. The texture is silty clay loam, silty clay, or clay. In some pedons, the texture is clayey shale.

The Cr horizon extends to a depth of more than 60 inches. It is level bedded, weathered shale or interbedded sandstone and shale in shades of red, yellow, or gray.

Wax Series

The Wax series consists of deep, moderately well drained, slowly permeable soils that formed in loamy alluvium and colluvium. The Wax soils are on flood plains and stream terraces. The slope ranges from 0 to 3 percent.

Wax soils are geographically associated with Allen, Cane, Mooreville, Conasauga, Dewey, Firestone, Lobelville, Minvale, Tanyard, Tasso, and Townley soils.

Allen, Cane, and Tasso soils are on toe slopes and colluvial fans adjacent to Wax soils. Allen and Tasso soils do not have a fragipan. Cane soils are more red than Wax soils. Mooreville, Lobelville, and Tanyard soils are on similar landforms as Wax soils or on slightly lower or higher landforms and do not have a fragipan. Conasauga, Dewey, Firestone, Minvale, and Townley soils are on upland. These soils are better drained than Wax soils.

Typical pedon of Wax loam, 0 to 3 percent slopes, in a wooded area 1.5 miles west of Logan Martin Dam, 300 feet south of the northeast corner of sec. 31, T. 18 S., R. 3 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam; weak fine subangular blocky and weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

BE—5 to 9 inches; mixed, light yellowish brown (2.5Y 6/4) and dark grayish brown (10YR 4/2) loam; weak medium subangular blocky structure; friable; many fine roots; very strongly acid; clear smooth boundary.

Bt—9 to 25 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; few medium and fine roots; thin discontinuous distinct clay films on faces of peds; 8 to 10 percent, by volume, fine and medium chert pebbles; very strongly acid; clear wavy boundary.

Bx1—25 to 35 inches; yellowish brown (10YR 5/6) cherty sandy clay loam; common medium distinct strong brown (7.5YR 5/6), light yellowish brown (10YR 6/4), and light gray (10YR 6/1) mottles; gray mottles in seams surrounding brown prisms; coarse platy parting to moderate fine subangular blocky structure; compact and brittle in about 60 percent of the horizontal cross section; 30 percent, by volume, fine and medium chert pebbles; very strongly acid; clear irregular boundary.

Bx2—35 to 65 inches; distinctly mottled, light gray (10YR 6/1), yellowish brown (10YR 5/8), and pale brown (10YR 6/3) cherty sandy clay loam; gray mottles in seams surrounding brown prisms; coarse platy parting to moderate fine subangular blocky structure; compact and brittle in about 70 percent of the horizontal cross section; 30 percent, by volume, fine and medium chert pebbles; very strongly acid.

The thickness of the solum is 40 to 60 inches or more. Depth to bedrock is 6 feet or more. Depth to the fragipan ranges from 25 to 35 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The texture is fine sandy loam or loam. The content of chert fragments ranges from 5 to 15 percent, by volume. The fragments generally are less than 4 inches in diameter.

The BE horizon, if present, is less than 8 inches thick. It has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4 to 8. The texture is loam or clay loam. The content of chert fragments ranges from 3 to 15 percent, by volume. The fragments generally are less than 4 inches in diameter.

The Bt horizon is 8 to 20 inches thick. It has hue of 2.5Y to 7.5YR, value of 5 or 6, and chroma of 4 to 8. The texture of the Bt horizon is silty clay loam, clay loam, or loam. The content of chert fragments ranges from 5 to 15 percent, by volume. The fragments generally are less than 4 inches in diameter.

The Bx horizon generally extends to a depth of more than 60 inches. It has hue of 10YR, value of 5, and chroma of 4 or 6. This horizon has few to many mottles in shades of gray; or it is mottled in shades of yellow, brown, red, or gray. The texture is cherty sandy clay loam, cherty loam, or cherty clay loam. The content of chert fragments ranges from 15 to 35 percent. The fragments generally are less than 5 inches in diameter.

Waynesboro Series

The Waynesboro series consists of deep, well drained, moderately permeable soils that formed in alluvium. The Waynesboro soils are on stream terraces and upland benches. The slope ranges from 2 to 15 percent.

Waynesboro soils are geographically associated with Allen, Choccolocco, Dewey, Holston, Nella, Tanyard, and Toccoa soils. Allen and Dewey soils are on uplands adjacent to Waynesboro soils. Allen soils have less clay than Waynesboro soils, and Dewey soils have less sand. Choccolocco and Toccoa soils are on slightly lower landforms than Waynesboro soils and are more yellow. Holston soils are on similar landforms as Waynesboro soils but are more yellow. Tanyard soils are on lower flood plains and are moderately well drained.

Typical pedon of Waynesboro sandy loam, 6 to 15 percent slopes, in a cultivated field about 3 miles south of Ragland, 250 feet north and 2,600 feet west of the southeast corner of sec. 31, T. 15 S., R 5 E.

Ap—0 to 5 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Bt1—5 to 18 inches; yellowish red (5YR 4/8) clay loam; weak medium subangular blocky structure; friable; few fine roots; thin patchy faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—18 to 60 inches or more; mottled, yellowish red (5YR 4/8), red (2.5YR 4/8), and reddish yellow (7.5YR 6/6) clay; moderate medium subangular blocky structure; friable; 10 percent, by volume, chert and sandstone pebbles few fine roots; thin patchy distinct clay films on faces of peds; strongly acid.

The thickness of the solum is 60 inches or more. Depth to bedrock is 6 feet or more. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is 2 to 9 inches thick. It has hue of 10YR to 5YR, value of 3 to 5, and chroma of 3 to 5. The texture is sandy loam or loam. The content of rounded chert or quartz fragments range from 0 to 10 percent, by volume. The fragments generally are less than 3 inches in diameter.

The BE horizon, if present, is less than 8 inches thick. It has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is loam, or clay loam. The content of rounded chert or quartz fragments is 10 percent or less by volume. The fragments generally are less than 3 inches in diameter.

The Bt horizon extends to a depth of more than 60 inches. It has hue of 5YR or 2.5YR, value of 4 to 6, and chroma of 6 or 8. The lower part of the Bt horizon has hue of 2.5YR, value of 3, and chroma of 6. This horizon has none to many mottles in shades of red, yellow, or brown. Texture of the Bt horizon is clay or clay loam. The content of rounded or angular fragments is 10 percent or less, by volume. The fragments generally are less than 3 inches in diameter.

Formation of the Soils

In this section, the major factors of soil formation are described and related to the soils of St. Clair County.

Soils result from five factors that influence geologic landforms. These factors are parent material, climate, plants and animals, relief, and time. They are interrelated to some degree, but the importance of any one factor varies from one place to another.

Parent material

The parent material is the unconsolidated mass from which a soil forms. This material contributes greatly to the chemical and mineralogical composition of a soil. The parent material of St. Clair County is predominantly material that has weathered from residuum rock, and material that has been deposited by alluvial and colluvial processes. Most of the residuum rock in this county is shale, limestone, sandstone, or chert. Deposits from the uplands make up the accumulated material that represent the alluvial and colluvial derived soils.

Climate

Temperature and precipitation are the two main climatic factors that affect the physical, chemical, and biological parts of the soil. Water dissolves minerals, supports biological activity, and transports mineral and organic residues through the soil profile. Percolation through the soil mainly depends on the amount and intensity of rainfall, relative humidity, and the length of the frost-free period. Physiographic position and permeability also affect the rate of downward percolation through the soil. To a great degree, the temperature influences the species, distribution, and growth of plants and animals in and on the soils. The rate of physical and chemical reactions in the soil is also influenced by temperature. St. Clair County has a temperate, humid climate.

Plant and Animal Life

Bacteria, fungi, ferns, earthworms, shrews, trees, shrubs, and other forms of life on and in the soil are agents in the soil-forming process. In a reciprocal fashion, the soil has a great influence on the species, composition, and distribution of plant and animal life. Also, climate, population pressure, natural and manmade barriers, plant and animal introductions, and cultural practices have influenced the plant and animal population.

The native vegetation of the soils on the uplands of St. Clair County consisted of deciduous trees, pine trees, and heath shrubs as a dominant overstory community. The deciduous trees and pine trees were dominant overstory species on the uplands. The heath shrubs occurred as dominant overstory species on sandstone balds on the steep landscapes.

The deciduous trees were dominant on the cool upland sites. The most common deciduous hardwood species were white oak, red oak, chestnut oak, yellow-poplar, hickory, and chestnut.

The pine trees were dominant on the dry upland sites. The most common species were loblolly and longleaf pine.

The soils on the lowlands and stream terraces were dominated by deciduous hardwood overstory. The most common species were beech, water oak, elm, yellow-poplar, sweetgum, blackgum, and basswood.

In ponded areas, such as beaver ponds and limesinks, the dominant vegetation was hydrophytic herbaceous plants and woody aquatic shrubs. Some hydrophytic herbaceous species that inhabitated the ponded areas included arrow-arum, sedges, rushes, cattail, panicgrass, and lizard tail. Some of the species of the woody aquatic shrub group were blackgum, buttonbush, alder, and willow. The heath shrub community consisted mostly of sparkleberry and mountain-laurel.

Open areas that were caused by tornadoes, fires, and the activities of aboriginal man were composed mostly of fast-growing herbaceous plants that were able to invade and flourish in a sunny environment. Some herbaceous plants that invaded the open areas were sunflowers, asters, bluestems, and primrose.

The understory woody and herbaceous plants that live below the shade of the dominant overstory were beechdrops, red maple, holly, privet, mayapple, bladdernut, troutlily, bloodroot, trailing trillium, piedmont and Alabama azaleas, sweetshrub, yellow ladyslipper, Indian pink, and dogwood. These plant species that represent a particular community are only a very limited listing of the species that once inhabited this county.

The communities of plants are also reflected in the species distribution of fauna. These animals, in turn, have an impact on the soil properties of a particular area, such as the aeration that worms, moles, and woodchucks provide to a compacted soil. Also, microbes of a particular plant community react to various soil

conditions and consequently influence the soil profile by providing nitrogen and decayed organic matter (both plant and animal) to the soil matrix.

Relief

Relief influences soil formation by its effect on runoff, erosion, movement of water within the soil, plant cover, and to some extent soil temperature. Relief is determined mostly by bedrock and carved stream formations. St. Clair County ranges from nearly level to steep. As the slope increases, runoff also increases, which causes less water to enter and move through the soil. The hazard of erosion also increases with increased slope.

In St. Clair County, soils such as Allen, Dewey, and Holston soils have slope of less than 15 percent and have deep, well-developed profiles. In the steep areas, soil material is washed away about as fast as it accumulates.

Time

Time is required for the formation of soils that have distinct horizons. Other soil-forming factors determine the length of time needed for the development of a soil profile. Generally, less time is required for a soil to develop in a humid, warm region than in a dry or cold region. Fine-textured parent material develops into soil more slowly than coarse-textured material.

The soils of St. Clair County range from very young to very old. A young soil has not been changed enough by the soil forming process to have developed well defined, genetically-related horizons but often has some characteristics of its parent material. These young soils are on flood plains and steep hillsides. Mooreville and Toccoa soils are examples of young soils that have formed on flood plains in St. Clair County. Material is still being deposited on these soils.

An old soil is one that has been in place for a long time and is considered to have reached equilibrium with its environment. It has a well-developed profile of genetically related horizons. Allen, Dewey, and Nella soils are examples of old soils in St. Clair County.

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Glossary

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.

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.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2
Low	2 to 4.5
Medium	4.6 to 6.9
High	7 or more

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, 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 constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

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 periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

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 the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

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.

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.

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.

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 up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

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 upper case letter represents the major horizons. Numbers or lower case 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 at the surface of a mineral soil.

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, alluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon 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. The combined A, E, and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

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 A or B horizon. 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, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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 rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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.

Low strength. The soil is not strong enough to support loads.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

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. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are 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 the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

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.

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 affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

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. For example, slope, stoniness, and thickness.

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.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 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.

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 is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size 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.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. 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. 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 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

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 insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 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 of separates recognized in the United States are as follows:

	Millimeters
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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind 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).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

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.

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 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.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). 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.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1960-76 at Pell City, Alabama]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	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----	52.5	28.4	40.6	75	2	44	6.01	3.74	8.04	8	0.3
February---	55.7	29.1	42.4	76	9	23	5.60	2.66	8.14	7	.0
March------	65.3	37.0	51.2	84	20	143	7.25	4.12	10.02	8	.0
April------	75.0	45.3	60.2	89	29	306	5.11	2.49	7.37	7	.0
May--------	79.9	53.1	66.5	91	35	512	4.78	2.48	6.77	7	.0
June-------	86.0	61.0	73.5	95	47	705	4.27	2.19	6.07	6	.0
July-------	88.9	65.3	77.1	98	53	840	4.91	2.54	6.97	9	.0
August-----	87.9	64.7	76.4	97	52	818	4.02	2.53	5.35	7	.0
September--	83.4	59.0	71.3	96	39	639	4.67	2.08	6.87	6	.0
October----	74.2	45.8	60.3	87	29	327	2.70	1.34	3.93	4	.0
November---	64.1	36.2	50.2	80	19	87	3.96	2.54	5.24	6	.0
December---	55.2	30.7	42.9	75	9	51	6.75	3.66	9.46	8	.0
Yearly:											
Average--	72.3	46.3	59.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	98	2	---	---	---	---	---	---
Total----	---	---	---	---	---	4,495	60.03	52.90	66.84	83	.3

* 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° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Based on data recorded in the period 1960-76 at Pell City, Alabama]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 30	April 10	April 22
2 years in 10 later than--	March 23	April 4	April 17
5 years in 10 later than--	March 9	March 23	April 8
First freezing temperature in fall:			
1 year in 10 earlier than--	October 30	October 25	October 10
2 years in 10 earlier than--	November 3	October 29	October 16
5 years in 10 earlier than--	November 11	November 6	October 27

TABLE 3.--GROWING SEASON

[Based on data recorded in the period 1960-76 at Pell City, Alabama]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	231	211	180
8 years in 10	236	217	188
5 years in 10	247	227	202
2 years in 10	259	238	218
1 year in 10	267	246	230

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP

Map unit	Extent of area	Cultivated crops	Specialty crops	Woodland	Urban uses	Intensive recreation areas	Extensive recreation areas
	Pct						
1. Nauvoo-Townley-Rock outcrop	29	Poor: slope.	Poor: slope.	Fair: slope, depth to rock.	Poor: slope, depth to rock.	Poor: slope.	Good.
2. Minvale-Nella-Bodine	1	Poor: slope.	Poor: slope.	Fair: slope.	Poor: slope.	Poor: slope.	Good.
3. Minvale-Nella-Townley	10	Poor: slope.	Poor: slope.	Fair: slope.	Poor: slope.	Poor: slope.	Good.
4. Minvale-Bodine	3	Poor: slope, small stones.	Poor: slope.	Fair: slope.	Poor: slope.	Poor: slope, small stones.	Good.
5. Nauvoo-Townley	3	Good to fair: slope, depth to rock.	Fair: slope, depth to rock.	Fair: depth to rock.	Fair to poor: depth to rock, percs slowly.	Fair: slope.	Good.
6. Minvale-Dewey	10	Fair: slope, small stones.	Fair to poor: slope, small stones.	Good----------	Good to fair: slope.	Good----------	Good.
7. Conasauga-Firestone	10	Fair: slope, depth to rock.	Poor: slope, depth to rock.	Fair: too clayey.	Poor: low strength, shrink-swell, percs slowly.	Poor: wetness, percs slowly.	Fair: too clayey.
8. Townley-Tasso-Wax	12	Fair: slope, depth to rock.	Poor: wetness, depth to rock.	Good----------	Fair to poor: wetness, percs slowly.	Fair: slope.	Good.
9. Minvale-Cane-Wax	9	Fair: slope.	Fair: slope, wetness.	Good----------	Good to fair: wetness, percs slowly.	Good----------	Good.
10. Waynesboro-Holston	1	Good----------	Fair: wetness.	Good----------	Good to fair: slope.	Good----------	Good.
11. Choccolocco-Mooreville-Wax	2	Fair to good: flooding.	Poor: flooding, wetness.	Good----------	Poor: flooding, wetness.	Fair: flooding, wetness.	Fair: wetness.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AeB	Allen gravelly sandy loam, 2 to 8 percent slopes	2,400	0.6
AeD	Allen gravelly sandy loam, 8 to 15 percent slopes	3,300	0.8
CaB	Cane loam, 2 to 8 percent slopes	5,300	1.3
CaD	Cane loam, 8 to 12 percent slopes	1,600	0.4
ChA	Choccolocco silt loam, 0 to 2 percent slopes	4,200	1.0
CoB	Conasauga and Firestone silt loams, 1 to 8 percent slopes	36,000	8.8
DeB	Dewey loam, 2 to 8 percent slopes	6,700	1.6
DeD	Dewey loam, 8 to 15 percent slopes	5,200	1.3
DwC3	Dewey silty clay loam, 4 to 12 percent slopes, severely eroded	600	0.1
EmA	Emory silt loam, 0 to 2 percent slopes	400	0.1
FcD	Firestone and Conasauga silt loams, 8 to 15 percent slopes	1,500	0.4
GaA	Gaylesville silt loam, 0 to 2 percent slopes	8,800	2.1
HoB	Holston sandy loam, 2 to 6 percent slopes	1,200	0.3
LoA	Lobelville cherty silt loam, 0 to 2 percent slopes	1,100	0.3
McB	Minvale cherty loam, 2 to 8 percent slopes	10,000	2.4
McD	Minvale cherty loam, 8 to 15 percent slopes	28,400	6.9
MdF	Minvale-Dewey complex, 15 to 30 percent slopes	13,700	3.3
MEB	Minvale-Bodine association, steep	10,000	2.4
MNB	Minvale-Nella-Bodine association, steep	5,000	1.2
MNT	Minvale-Nella-Townley association, steep	40,000	9.8
MvA	Mooreville silt loam, 0 to 2 percent slopes	7,400	1.8
NaB	Nauvoo sandy loam, 2 to 6 percent slopes	1,500	0.4
NaD	Nauvoo sandy loam, 8 to 15 percent slopes	8,200	2.0
NbD	Nauvoo-Rock outcrop complex, 2 to 15 percent slopes	900	0.2
NbF	Nauvoo-Rock outcrop complex, 15 to 30 percent slopes	1,000	0.2
NCR	Nauvoo-Rock outcrop association, rolling	6,100	1.5
NCS	Nauvoo-Rock outcrop association, steep	24,400	6.0
NET	Nauvoo-Townley association, steep	81,000	19.9
NgC	Nella gravelly sandy loam, 4 to 12 percent slopes	400	0.1
NtD	Nella-Townley complex, 6 to 15 percent slopes	1,100	0.3
Pd	Pits and Dumps	700	0.2
RNT	Rock outcrop-Nella-Townley association, steep	12,000	2.9
TaA	Tanyard silt loam, 0 to 2 percent slopes	8,700	2.1
TbC	Tasso sandy loam, 4 to 12 percent slopes	5,900	1.4
TcA	Toccoa sandy loam, 0 to 2 percent slopes	900	0.2
TeB	Townley silt loam, 2 to 6 percent slopes	6,800	1.7
TeD	Townley silt loam, 6 to 15 percent slopes	18,900	4.6
TgF	Townley gravelly loam, 15 to 30 percent slopes	6,400	1.6
TNR	Townley-Nauvoo association, rolling	13,700	3.4
UtB	Urban land-Townley complex, 2 to 8 percent slopes	400	0.1
WaA	Wax loam, 0 to 3 percent slopes	14,400	3.5
WyB	Waynesboro sandy loam, 2 to 6 percent slopes	1,000	0.2
WyD	Waynesboro sandy loam, 6 to 15 percent slopes	400	0.1
	Water	2,000	0.5
	Total	409,600	100.0

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn	Soybeans	Tall fescue	Improved bermuda-grass	Wheat	Corn silage	Bahiagrass
		Bu	Bu	AUM*	AUM*	Bu	Tons	AUM*
AeB--Allen	IIe	75	35	6.0	8.0	45	15	7.5
AeD--Allen	IVe	70	30	5.0	7.0	35	14	7.0
CaB--Cane	IIe	65	30	5.5	7.5	35	13	6.5
CaD--Cane	IIIe	60	25	5.0	7.0	30	12	6.0
ChA--Choccolocco	IIw	95	35	9.0	10.0	40	19	9.5
CoB--Conasauga and Firestone	IIIe	56	20	5.5	---	25	11	6.5
DeB--Dewey	IIe	80	35	6.0	8.5	45	16	8.0
DeD--Dewey	IVe	70	30	5.5	8.0	35	13	7.5
DwC3--Dewey	IVe	42	20	4.5	7.0	30	9	7.0
EmA--Emory	IIw	110	40	8.5	9.0	40	22	9.0
FcD--Firestone and Conasauga	VIe	---	---	5.0	---	---	---	---
GaA--Gaylesville	IVw	---	---	6.5	---	---	---	---
HoB--Holston	IIe	90	40	7.5	10.0	45	18	9.0
LoA--Lobelville	IIIw	65	30	7.0	---	---	13	---
McB--Minvale	IIe	85	30	5.5	7.0	45	16	7.0
McD--Minvale	IVe	65	25	5.0	6.5	30	13	6.5
MdF--Minvale-Dewey	VIe	---	---	---	---	---	---	---
MEB:								
Minvale	VIIe	---	---	---	---	---	---	---
Bodine	VIIs	---	---	---	---	---	---	---
MNB:								
Minvale	VIIe	---	---	---	---	---	---	---
Nella	VIIe	---	---	---	---	---	---	---
Bodine	VIIs	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tall fescue	Improved bermuda-grass	Wheat	Corn silage	Bahiagrass
		Bu	Bu	AUM*	AUM*	Bu	Tons	AUM*
MNT---------- Minvale-Nella-Townley	VIIe	---	---	---	---	---	---	---
MvA---------- Mooreville	Vw	---	---	8.0	---	---	---	8.0
NaB---------- Nauvoo	IIe	75	30	6.5	8.0	40	15	6.0
NaD---------- Nauvoo	IVe	55	25	5.0	7.5	30	11	5.5
NbD:								
Nauvoo---------	IVe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
NbF:								
Nauvoo---------	VIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
NCR:								
Nauvoo---------	IVe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
NCS:								
Nauvoo---------	VIIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
NET---------- Nauvoo-Townley	VIIe	---	---	---	---	---	---	---
NgC---------- Nella	IVe	55	25	6.0	6.5	35	11	6.0
NtD:								
Nella----------	IVe	---	---	4.0	---	---	---	---
Townley--------	VIe	---	---	---	---	---	---	---
Pd---------- Pits and Dumps	VIIIs	---	---	---	---	---	---	---
RNT:								
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
Nella----------	VIIe	---	---	---	---	---	---	---
Townley--------	VIIe	---	---	---	---	---	---	---
TaA---------- Tanyard	IIIw	70	31	6.0	5.0	42	14	5.0
TbC---------- Tasso	IIIe	70	30	5.5	7.0	35	14	6.5
TcA---------- Toccoa	IIw	80	30	6.0	6.0	35	16	6.0
TeB---------- Townley	IIIe	55	25	5.5	6.0	30	11	4.0

See footnote at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tall fescue	Improved bermuda-grass	Wheat	Corn silage	Bahiagrass
		Bu	Bu	AUM*	AUM*	Bu	Tons	AUM*
TeD--Townley	VIe	---	---	4.5	5.0	---	---	3.5
TgF--Townley	VIIe	---	---	---	---	---	---	---
TNR:								
Townley	VIe	---	---	5.0	5.5	---	---	3.5
Nauvoo	IVe	---	---	5.0	5.5	---	---	4.0
UtB--Urban land-Townley	---	---	---	---	---	---	---	---
WaA--Wax	IIw	65	30	6.0	6.0	30	13	5.5
WyB--Waynesboro	IIe	90	35	8.0	9.0	40	18	8.0
WyD--Waynesboro	IVe	70	25	7.5	7.5	30	14	7.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
AeB, AeD---------- Allen	3o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	87	Yellow-poplar, loblolly pine.
							Shortleaf pine------	72	
							Loblolly pine-------	80	
CaB, CaD---------- Cane	3o	Slight	Slight	Slight	Moderate	Moderate	Yellow-poplar-------	90	Loblolly pine, yellow-poplar.
							Sweetgum-----------	80	
							Loblolly pine-------	80	
							Shortleaf pine------	70	
							Virginia pine-------	70	
ChA---------- Choccolocco	3o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine-------	80	Loblolly pine, Virginia pine, yellow-poplar.
							Shortleaf pine------	70	
							Southern red oak----	70	
							Virginia pine-------	70	
							Yellow-poplar-------	90	
							Water oak----------	90	
CoB:									
Conasauga---------	4c	Moderate	Moderate	Slight	Slight	Moderate	Shortleaf pine------	60	Loblolly pine.
							Virginia pine-------	60	
							Loblolly pine-------	72	
							Eastern redcedar----	50	
							Northern red oak----	60	
Firestone---------	4c	Slight	Moderate	Slight	Slight	Slight	Loblolly pine-------	70	Loblolly pine.
							Shortleaf pine------	60	
							Virginia pine-------	60	
							Eastern redcedar----	50	
DeB, DeD---------- Dewey	3o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	90	Yellow-poplar, loblolly pine.
							White oak----------	70	
							Southern red oak----	70	
							Shortleaf pine------	73	
							Virginia pine-------	70	
							Loblolly pine-------	78	
DwC3---------- Dewey	4c	Moderate	Moderate	Moderate	Slight	Moderate	Loblolly pine-------	70	Loblolly pine.
							Virginia pine-------	60	
							Eastern redcedar----	40	
							Eastern white pine--	70	
EmA---------- Emory	2o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	104	Yellow-poplar, loblolly pine.
							Loblolly pine-------	90	
							Black walnut--------	---	
							White ash----------	---	
							Black cherry--------	---	
							American sycamore---	100	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
FcD:									
Firestone	4c	Slight	Moderate	Slight	Slight	Slight	Loblolly pine	70	Loblolly pine.
							Shortleaf pine	60	
							Virginia pine	60	
							Eastern redcedar	50	
FeD:									
Conasauga	4c	Moderate	Moderate	Slight	Slight	Moderate	Shortleaf pine	60	Loblolly pine.
							Virginia pine	71	
							Loblolly pine	72	
							Eastern redcedar	50	
							Northern red oak	60	
GaA	3w	Slight	Severe	Moderate	Slight	Severe	Sweetgum	80	Loblolly pine,
Gaylesville							Loblolly pine	80	sweetgum, water
							Shortleaf pine	70	oak.
							Water oak	70	
HoB	3o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	86	Loblolly pine,
Holston							Northern red oak	78	yellow-poplar.
							Shortleaf pine	69	
							Loblolly pine	85	
							Virginia pine	73	
LoA	2w	Slight	Moderate	Slight	Slight	Severe	Yellow-poplar	94	Yellow-poplar,
Lobelville							Southern red oak	76	loblolly pine,
							Loblolly pine	90	sweetgum, water
							Black walnut	---	oak.
							Water oak	90	
							Sweetgum	90	
McB, McD	3o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar,
Minvale							Shortleaf pine	70	loblolly pine.
							Loblolly pine	80	
							Virginia pine	70	
							White oak	60	
							Black walnut	---	
MdF:									
Minvale	3r	Moderate	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	Yellow-poplar,
							Shortleaf pine	70	loblolly pine.
							Loblolly pine	80	
							Virginia pine	70	
							White oak	60	
							Black walnut	---	
Dewey	3r	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar,
							White oak	70	loblolly pine.
							Southern red oak	70	
							Shortleaf pine	73	
							Virginia pine	70	
							Loblolly pine	78	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
MEB:									
Minvale	3r	Moderate	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, loblolly pine.
							Shortleaf pine	70	
							Loblolly pine	80	
							Virginia pine	70	
							White oak	60	
							Black walnut	---	
Bodine	4f	Moderate	Moderate	Severe	Slight	Slight	Scarlet oak	55	Loblolly pine.
							Loblolly pine	70	
							Virginia pine	60	
							Chestnut oak	55	
							Shortleaf pine	60	
MNB:									
Minvale	3r	Moderate	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, loblolly pine.
							Shortleaf pine	70	
							Loblolly pine	80	
							Virginia pine	70	
							White oak	60	
							Black walnut	---	
Nella	3x	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	87	Yellow-poplar, loblolly pine.
							Shortleaf pine	71	
							Virginia pine	73	
							Northern red oak	71	
							Eastern redcedar	61	
							White ash	---	
							Black walnut	---	
							Loblolly pine	80	
Bodine	4f	Moderate	Moderate	Severe	Slight	Slight	Scarlet oak	55	Loblolly pine.
							Loblolly pine	70	
							Chestnut oak	55	
							Virginia pine	60	
							Shortleaf pine	60	
MNT:									
Minvale	3r	Moderate	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, loblolly pine.
							Shortleaf pine	70	
							Loblolly pine	80	
							Virginia pine	70	
							White oak	60	
							Black walnut	---	
Nella	3x	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	87	Yellow-poplar, shortleaf pine, Virginia pine, loblolly pine, black walnut.
							Shortleaf pine	71	
							Virginia pine	73	
							Northern red oak	71	
							Eastern redcedar	61	
							White ash	---	
							Black walnut	---	
							Loblolly pine	80	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
MNT:									
Townley	4r	Severe	Severe	Severe	Moderate	Moderate	Loblolly pine	70	Loblolly pine.
							Virginia pine	70	
							Shortleaf pine	60	
MvA	1w	Slight	Severe	Severe	Slight	Moderate	Cherrybark oak	100	Cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, yellow-poplar, American sycamore.
Mooreville							Green ash	80	
							Loblolly pine	95	
							Sweetgum	100	
							Yellow-poplar	100	
							American sycamore	100	
NaB, NaD	2o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
Nauvoo							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
NbD:									
Nauvoo	2o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
Rock outcrop.									
NbF:									
Nauvoo	2r	Moderate	Moderate	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
Rock outcrop.									
NCR:									
Nauvoo	2o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
Rock outcrop.									
NCS:									
Nauvoo	2r	Moderate	Moderate	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
Rock outcrop.									

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
NET:									
Nauvoo	2r	Moderate	Moderate	Slight	Slight	Moderate	Loblolly pine	89	Loblolly pine, yellow-poplar, sweetgum.
							Shortleaf pine	80	
							Virginia pine	80	
							Yellow-poplar	100	
							Sweetgum	90	
Townley	4r	Severe	Severe	Severe	Moderate	Moderate	Loblolly pine	70	Loblolly pine.
							Virginia pine	70	
							Shortleaf pine	60	
NgC	3x	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	87	Yellow-poplar, loblolly pine.
Nella							Shortleaf pine	71	
							Virginia pine	73	
							Northern red oak	71	
							Eastern redcedar	61	
							White ash	---	
							Black walnut	---	
							Loblolly pine	80	
NtD:									
Nella	3x	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	87	Yellow-poplar, loblolly pine.
							Shortleaf pine	71	
							Virginia pine	73	
							Northern red oak	71	
							Eastern redcedar	61	
							White ash	---	
							Black walnut	---	
							Loblolly pine	80	
Townley	4r	Moderate	Severe	Severe	Moderate	Moderate	Loblolly pine	70	Loblolly pine.
							Virginia pine	70	
							Shortleaf pine	60	
RNT:									
Rock outcrop.									
Nella	3x	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	87	Yellow-poplar, loblolly pine.
							Shortleaf pine	71	
							Virginia pine	73	
							Northern red oak	71	
							Eastern redcedar	61	
							White ash	---	
							Black walnut	---	
							Loblolly pine	80	
Townley	4r	Severe	Severe	Severe	Moderate	Moderate	Loblolly pine	70	Loblolly pine.
							Virginia pine	70	
							Shortleaf pine	60	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
TaA---------- Tanyard	2w	Slight	Moderate	Moderate	Slight	Severe	Yellow-poplar--------- Loblolly pine--------- Shortleaf pine-------- Sweetgum------------	100 90 80 90	Loblolly pine, yellow-poplar, sweetgum.
TbC---------- Tasso	3o	Slight	Slight	Slight	Slight	Slight	Yellow-poplar--------- White oak----------- Shortleaf pine-------- Virginia pine--------- Loblolly pine---------	90 70 70 70 80	Loblolly pine.
TcA---------- Toccoa	1o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine--------- Yellow-poplar--------- Sweetgum------------ Southern red oak----	90 107 100 ---	Loblolly pine, yellow-poplar, American sycamore.
TeB, TeD---------- Townley	4c	Slight	Moderate	Slight	Moderate	Moderate	Loblolly pine--------- Virginia pine--------- Shortleaf pine--------	70 70 60	Loblolly pine.
TgF---------- Townley	4r	Moderate	Severe	Moderate	Moderate	Moderate	Loblolly pine--------- Virginia pine--------- Shortleaf pine--------	70 70 60	Loblolly pine.
TNR: Townley----------	4c	Slight	Moderate	Slight	Moderate	Moderate	Loblolly pine--------- Virginia pine--------- Shortleaf pine--------	70 70 60	Loblolly pine.
Nauvoo----------	2o	Slight	Slight	Slight	Slight	Moderate	Loblolly pine--------- Shortleaf pine-------- Virginia pine--------- Yellow-poplar--------- Sweetgum------------	89 80 80 100 90	Loblolly pine, yellow-poplar, sweetgum.
WaA---------- Wax	3w	Slight	Moderate	Slight	Moderate	Moderate	Loblolly pine--------- Yellow-poplar--------- Shortleaf pine-------- Sweetgum------------ Southern red oak----	80 90 70 80 70	Loblolly pine, yellow-poplar.
WyB, WyD---------- Waynesboro	3o	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar--------- White oak----------- Loblolly pine--------- Shortleaf pine-------- Virginia pine---------	90 75 80 70 75	Yellow-poplar, loblolly pine.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AeB Allen	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
AeD Allen	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
CaB Cane	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Slight	Slight.
CaD Cane	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Slight	Moderate: slope.
ChA Choccolocco	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
CoB: Conasauga	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, depth to rock.	Severe: erodes easily.	Moderate: thin layer.
Firestone	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones.
DeB Dewey	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
DeD, DwC3 Dewey	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
EmA Emory	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Moderate: ponding.
FcD: Firestone	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope.
Conasauga	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer.
GaA Gaylesville	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, erodes easily.	Severe: wetness, flooding.
HoB Holston	Slight	Slight	Moderate: slope.	Slight	Slight.
LoA Lobelville	Severe: flooding, wetness.	Moderate: flooding, wetness small stones.	Severe: small stones, flooding.	Moderate: flooding.	Severe: flooding.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
McB Minvale	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
McD Minvale	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
MdF: Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MEB: Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Bodine	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
MNB: Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bodine	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
MNT: Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: slope.
MvA Mooreville	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
NaB Nauvoo	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
NaD Nauvoo	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
NbD: Nauvoo	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Rock outcrop.					

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NbF:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Rock outcrop.					
NCR:					
Nauvoo	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Rock outcrop.					
NCS:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
NET:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: slope.
NgC:					
Nella	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
NtD:					
Nella	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Townley	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope, thin layer.
Pd:					
Pits and Dumps.					
RNT:					
Rock outcrop.					
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope, erodes easily.	Severe: slope.
TaA:					
Tanyard	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
TbC:					
Tasso	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
TcA:					
Toccoa	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TeB---------- Townley	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones, thin layer.
TeD---------- Townley	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope, thin layer.
TgF---------- Townley	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
TNR: Townley----------	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Severe: erodes easily.	Moderate: small stones, slope, thin layer.
Nauvoo----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
UtB: Urban land.					
Townley----------	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Severe: erodes easily.	Moderate: small stones, thin layer.
WaA---------- Wax	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: flooding.	Slight----------	Moderate: wetness, flooding.
WyB---------- Waynesboro	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
WyD---------- Waynesboro	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AeB---------- Allen	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AeD---------- Allen	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CaB, CaD---------- Cane	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ChA---------- Choccolocco	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoB:										
Conasauga---------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Firestone---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DeB---------- Dewey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DeD---------- Dewey	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DwC3---------- Dewey	Poor	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
EmA---------- Emory	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FcD:										
Firestone---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Conasauga---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GaA---------- Gaylesville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
HoB---------- Holston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoA---------- Lobelville	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
McB---------- Minvale	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
McD---------- Minvale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MdF:										
Minvale----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Dewey----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MEB:										
Minvale----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
MEB:										
Bodine	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MNB:										
Minvale	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Nella	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Bodine	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MNT:										
Minvale	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Nella	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Townley	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MvA Mooreville	Poor	Fair	Fair	Good	---	Poor	Poor	Poor	Good	Poor.
NaB Nauvoo	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NaD Nauvoo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NbD:										
Nauvoo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										
NbF:										
Nauvoo	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
NCR:										
Nauvoo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										
NCS:										
Nauvoo	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
NET:										
Nauvoo	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Townley	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NgC---------- Nella	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NtD:										
Nella----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Townley----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pd: Pits and Dumps.										
RNT: Rock outcrop.										
Nella----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Townley----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaA---------- Tanyard	Poor	Fair	Fair	Good	Good	Poor	Fair	Fair	Good	Poor.
TbC---------- Tasso	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TcA---------- Toccoa	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TeB, TeD---------- Townley	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TgF---------- Townley	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
TNR:										
Townley----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Nauvoo----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
UtB: Urban land.										
Townley----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WaA---------- Wax	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WyB---------- Waynesboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WyD---------- Waynesboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AeB--- Allen	Moderate: too clayey.	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Moderate: small stones.
AeD--- Allen	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: small stones, slope.
CaB--- Cane	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Slight.
CaD--- Cane	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope.	Moderate: slope.
ChA--- Choccolocco	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
CoB:						
Conasauga---	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: thin layer.
Firestone---	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: small stones.
DeB--- Dewey	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
DeD, DwC3--- Dewey	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
EmA--- Emory	Severe: ponding.	Moderate: ponding.	Severe: ponding.	Moderate: ponding.	Severe: low strength, ponding.	Moderate: ponding.
FcD:						
Firestone---	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: small stones, slope.
Conasauga---	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, thin layer.
GaA--- Gaylesville	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
HoB--- Holston	Slight---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
LoA--- Lobelville	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
McB---------- Minvale	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones.
McD---------- Minvale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: small stones, slope.
MdF:						
Minvale----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dewey----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
MEB:						
Minvale----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bodine----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
MNB:						
Minvale----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nella----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bodine----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
MNT:						
Minvale----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nella----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MvA---------- Mooreville	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
NaB---------- Nauvoo	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
NaD---------- Nauvoo	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
NbD:						
Nauvoo----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Rock outcrop.						
NbF:						
Nauvoo----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
NCR:						
Nauvoo	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Rock outcrop.						
NCS:						
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
NET:						
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
NgC Nella	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
NtD:						
Nella	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
Townley	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope, thin layer.
Pd: Pits and Dumps.						
RNT: Rock outcrop.						
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Townley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
TaA Tanyard	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
TbC Tasso	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
TcA Toccoa	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
TeB Townley	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones, thin layer.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TeD---------- Townley	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope, thin layer.
TgF---------- Townley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
TNR:						
Townley----------	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope, thin layer.
Nauvoo----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
UtB:						
Urban land.						
Townley----------	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones, thin layer.
WaA---------- Wax	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
WyB---------- Waynesboro	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
WyD---------- Waynesboro	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "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; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AeB---- Allen	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
AeD---- Allen	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
CaB---- Cane	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
CaD---- Cane	Severe: wetness, percs slowly.	Severe: slope.	Moderate: slope.	Moderate: wetness, slope.	Fair: slope, wetness.
ChA---- Choccolocco	Severe: flooding.	Severe: seepage, flooding.	Severe: seepage, flooding.	Severe: flooding.	Good.
CoB: Conasauga----	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Firestone----	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
DeB---- Dewey	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----	Fair: too clayey, hard to pack.
DeD, DwC3---- Dewey	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
EmA---- Emory	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
FcD: Firestone----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Conasauga----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
GaA---- Gaylesville	Severe: flooding, wetness, percs slowly.	Slight----	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
HoB---- Holston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LoA Lobelville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: small stones, wetness.
McB Minvale	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
McD Minvale	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones.
MdF: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MEB: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Bodine	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: small stones, slope.
MNB: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Bodine	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: small stones, slope.
MNT: Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Townley	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: area reclaim, too clayey, slope.
MvA Mooreville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
NaB Nauvoo	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Slight	Fair: area reclaim, thin layer.
NaD Nauvoo	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: area reclaim, thin layer, slope.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NbD:					
Nauvoo	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: area reclaim, thin layer, slope.
Rock outcrop.					
NbF:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
Rock outcrop.					
NCR:					
Nauvoo	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: area reclaim, thin layer, slope.
Rock outcrop.					
NCS:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
Rock outcrop.					
NET:					
Nauvoo	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
Townley	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: area reclaim, too clayey, slope.
NgC	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey, large stones.	Moderate: slope.	Poor: small stones.
Nella					
NtD:					
Nella	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey, large stones.	Moderate: slope.	Poor: small stones.
Townley	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, thin layer.
Pd:					
Pits and Dumps.					
RNT:					
Rock outcrop.					
Nella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RNT: Townley	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: area reclaim, too clayey, slope.
TaA Tanyard	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
TbC Tasso	Moderate: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Fair: too clayey, slope.
TcA Toccoa	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Good.
TeB Townley	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, thin layer.
TeD Townley	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, thin layer.
TgF Townley	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, slope.
TNR: Townley	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, thin layer.
Nauvoo	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: area reclaim, thin layer, slope.
UtB: Urban land.					
Townley	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, thin layer.
WaA Wax	Severe: percs slowly, flooding.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding.	Poor: small stones.
WyB Waynesboro	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
WyD Waynesboro	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AeB, AeD Allen	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
CaB Cane	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
CaD Cane	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope, thin layer.
ChA Choccolocco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
CoB: Conasauga	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Firestone	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
DeB, DeD, DwC3 Dewey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
EmA Emory	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
FcD: Firestone	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Conasauga	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
GaA Gaylesville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
HoB Holston	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
LoA Lobelville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
McB, McD Minvale	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MdF: Minvale	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
MdF:				
Dewey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MEB:				
Minvale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Bodine	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MNB:				
Minvale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Nella	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Bodine	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MNT:				
Minvale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Nella	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Townley	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MvA Mooreville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
NaB Nauvoo	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
NaD Nauvoo	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.
NbD:				
Nauvoo	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
NbD: Rock outcrop.				
NbF: Nauvoo	Fair: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rock outcrop.				
NCR: Nauvoo	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.
Rock outcrop.				
NCS: Nauvoo	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rock outcrop.				
NET: Nauvoo	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Townley	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
NgC Nella	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
NtD: Nella	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Townley	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Pd: Pits and Dumps.				
RNT: Rock outcrop.				
Nella	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Townley	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
TaA Tanyard	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
TbC---------- Tasso	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
TcA---------- Toccoa	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
TeB, TeD---------- Townley	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TgF---------- Townley	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
TNR:				
Townley----------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Nauvoo----------	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.
UtB:				
Urban land.				
Townley----------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WaA---------- Wax	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
WyB, WyD---------- Waynesboro	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AeB---- Allen	Moderate: seepage.	Severe: piping.	Deep to water	Slope----	Favorable----	Favorable.
AeD---- Allen	Moderate: seepage.	Severe: piping.	Deep to water	Slope----	Slope----	Slope.
CaB---- Cane	Moderate: slope.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
CaD---- Cane	Severe: slope.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Slope, erodes easily, rooting depth.	Erodes easily, slope, rooting depth.
ChA---- Choccolocco	Moderate: seepage.	Severe: piping.	Deep to water	Flooding----	Erodes easily	Erodes easily.
CoB:						
Conasauga----	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Firestone----	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
DeB---- Dewey	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----	Favorable----	Favorable.
DeD, DwC3---- Dewey	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----	Slope----	Slope.
EmA---- Emory	Moderate: seepage.	Severe: piping, ponding.	Ponding----	Ponding----	Erodes easily, ponding.	Erodes easily.
FcD:						
Firestone----	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Conasauga----	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
GaA---- Gaylesville	Slight----	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
HoB---- Holston	Moderate: seepage.	Severe: piping.	Deep to water	Slope----	Favorable----	Favorable.
LoA---- Lobelville	Moderate: seepage.	Severe: piping.	Flooding----	Wetness, flooding.	Wetness----	Wetness.
McB---- Minvale	Moderate: seepage.	Severe: piping.	Deep to water	Slope----	Favorable----	Favorable.
McD---- Minvale	Moderate: seepage.	Severe: piping.	Deep to water	Slope----	Slope----	Slope.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MdF:						
Minvale	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Dewey	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
MEB:						
Minvale	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Bodine	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
MNB:						
Minvale	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Nella	Severe: slope.	Severe: piping.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Bodine	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
MNT:						
Minvale	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Nella	Severe: slope.	Severe: piping.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Townley	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
MvA---------- Mooreville	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
NaB---------- Nauvoo	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Slope	Favorable	Favorable.
NaD---------- Nauvoo	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope	Slope	Slope.
NbD, NbF, NCR, NCS:						
Nauvoo	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope	Slope	Slope.
Rock outcrop.						
NET:						
Nauvoo	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope	Slope	Slope.
Townley	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
NgC---------- Nella	Moderate: seepage.	Severe: piping.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
NtD:						
Nella----------	Moderate: seepage.	Severe: piping.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Townley----------	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Pd: Pits and Dumps.						
RNT: Rock outcrop.						
Nella----------	Severe: slope.	Severe: piping.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Townley----------	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
TaA---------- Tanyard	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Favorable.
TbC---------- Tasso	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
TcA---------- Toccoa	Severe: seepage.	Severe: piping.	Flooding-------	Flooding-------	Favorable------	Favorable.
TeB---------- Townley	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
TeD---------- Townley	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
TgF---------- Townley	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
TNR:						
Townley----------	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Nauvoo----------	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope----------	Slope----------	Slope.
UtB: Urban land.						
Townley----------	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
WaA---------- Wax	Slight---------	Slight---------	Flooding-------	Rooting depth, wetness, percs slowly.	Erodes easily, rooting depth, wetness.	Erodes easily, rooting depth, percs slowly.
WyB---------- Waynesboro	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
WyD---------- Waynesboro	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AeB---------- Allen	0-5	Gravelly sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-8	75-90	60-75	45-70	25-65	<26	NP-10
	5-60	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7-6	0-10	85-100	75-100	65-98	50-80	20-43	4-19
AeD---------- Allen	0-8	Gravelly sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4	0-8	75-90	60-75	45-70	25-65	<26	NP-10
	8-65	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7-6	0-10	85-100	75-100	65-98	50-80	20-43	4-19
CaB, CaD--------- Cane	0-5	Loam----------	ML, SM	A-4	0-2	80-100	75-100	65-95	40-75	<30	NP-7
	5-25	Silt loam, loam, clay loam.	ML, CL-ML, CL	A-4, A-6	0-2	90-100	80-100	75-100	60-85	17-32	3-12
	25-62	Silt loam, loam, clay loam.	ML, CL-ML, CL	A-4, A-6	0-2	90-100	80-100	75-100	55-85	18-37	3-15
ChA---------- Choccolocco	0-6	Silt loam--------	ML	A-4	0	94-100	85-100	70-98	60-90	28-40	NP-8
	6-56	Silty clay loam, silt loam, loam.	ML	A-4, A-6, A-7	0	95-100	95-100	85-98	60-95	35-45	7-14
	56-72	Sandy loam, loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	95-100	89-100	60-95	30-75	<35	NP-7
CoB:											
Conasauga-------	0-4	Silt loam--------	CL-ML, ML, CL	A-4	0	90-100	85-100	75-95	65-85	<30	NP-8
	4-24	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	90-100	85-100	85-95	80-90	41-60	18-35
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Firestone-------	0-6	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-5	76-100	70-100	60-90	55-90	20-40	2-15
	6-33	Clay----------	MH, CH	A-7	0	98-100	95-100	80-100	70-100	55-95	25-50
	33-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
DeB, DeD--------- Dewey	0-4	Loam----------	CL-ML, CL	A-4, A-6	0	90-100	80-100	75-95	65-80	24-30	5-11
	4-32	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	32-65	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
DwC3---------- Dewey	0-6	Silty clay loam	CL	A-6	0	90-100	80-100	75-95	70-80	25-39	12-20
	6-30	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	30-60	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
EmA---------- Emory	0-11	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0-2	95-100	90-100	85-100	80-95	25-40	4-15
	11-39	Silt loam, silty clay loam.	CL, ML, CL-ML	A-4, A-6	0-2	95-100	90-100	85-100	80-95	25-40	4-15
	39-65	Silty clay loam, silty clay.	CL	A-4, A-6, A-7	0-2	90-100	75-100	70-100	65-95	25-45	9-20
FcD:											
Firestone-------	0-6	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-5	76-100	70-100	60-90	55-90	20-40	2-15
	6-33	Clay----------	MH, CH	A-7	0	98-100	95-100	80-100	70-100	55-95	25-50
	33-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Conasauga-------	0-4	Silt loam--------	CL-ML, ML, CL	A-4	0	90-100	85-100	75-95	65-85	<30	NP-8
	4-24	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	90-100	85-100	85-95	80-90	41-60	18-35
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GaA--- Gaylesville	0-11	Silt loam---	CL, ML	A-4, A-6, A-7	0	100	95-100	90-100	75-95	30-45	8-15
	11-25	Silty clay, clay, clay loam.	CL, ML	A-6, A-7	0	100	95-100	95-100	80-95	35-50	11-20
	25-60	Silty clay, clay	CL, CH	A-7	0	100	95-100	95-100	85-95	41-60	20-35
HoB--- Holston	0-7	Sandy loam---	ML, CL-ML, SM, SM-SC	A-4, A-2	0-5	80-100	75-100	65-100	30-75	<22	NP-6
	7-60	Loam, clay loam, sandy clay loam.	ML, CL-ML, SM, SM-SC	A-4, A-2	0-5	80-100	75-100	50-100	30-80	21-33	3-10
LoA--- Lobelville	0-4	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-5	65-90	55-80	50-75	45-65	<30	NP-7
	4-23	Cherty clay loam, cherty loam, cherty silty clay loam.	CL-ML, ML, GM, GM-GC	A-4, A-6	0-5	65-90	50-80	45-70	40-65	22-35	3-12
	23-65	Cherty silt loam, very cherty loam, cherty sandy loam.	ML, CL-ML, GM, GM-GC	A-4, A-2, A-6, A-1	0-10	50-80	25-70	20-70	15-65	23-35	3-12
McB--- Minvale	0-9	Cherty loam---	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	9-65	Cherty silty clay loam, cherty silty clay, cherty 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
McD--- Minvale	0-9	Cherty loam---	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	9-65	Cherty silty clay loam, cherty silty clay, cherty 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
MdF:											
Minvale---	0-6	Cherty loam---	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	6-60	Cherty silty clay loam, cherty silty clay, cherty 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
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
	4-14	Clay, silty clay, silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27-40	12-20
	14-60	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
MEB:											
Minvale---	0-12	Cherty loam---	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	12-60	Cherty silty clay loam, cherty silty clay, cherty 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
Bodine---	0-12	Cherty loam---	ML, CL-ML, GM, SM	A-4, A-2, A-1-B	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	12-60	Cherty silty clay loam, cherty clay loam, very cherty silt loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MNB:											
Minvale	0-8	Cherty loam	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	8-60	Cherty silty clay loam, cherty silty clay, cherty 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
Nella	0-10	Gravelly sandy loam.	ML, CL, GM, SM	A-4, A-2	0-10	65-90	60-80	55-65	30-55	<30	NP-8
	10-60	Cobbly clay loam, gravelly clay loam, cobbly sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-2	0-30	75-95	60-90	45-70	30-60	25-40	6-20
Bodine	0-12	Cherty loam	ML, CL-ML, GM, SM	A-4, A-2, A-1-B	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	12-60	Cherty silty clay loam, cherty clay loam, very cherty silt loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16
MNT:											
Minvale	0-7	Cherty loam	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	7-60	Cherty silty clay loam, cherty silty clay, cherty 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
Nella	0-10	Gravelly sandy loam.	ML, CL, GM, SM	A-4, A-2	0-10	65-90	60-80	55-65	30-55	<30	NP-8
	10-60	Cobbly clay loam, gravelly clay loam, cobbly sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-2	0-30	75-95	60-90	45-70	30-60	25-40	6-20
Townley	0-4	Silt loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	4-30	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	30-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
MvA---------- Mooreville	0-5	Silt loam	CL-ML, CL, SM-SC, SC	A-4	0	100	100	80-100	40-85	20-30	5-10
	5-47	Sandy clay loam, clay loam, loam.	CL, SC	A-6, A-7	0	100	100	80-95	45-80	28-50	15-30
	47-60	Loam, sandy clay loam, clay loam.	SC, CL	A-6, A-7	0	100	100	80-95	45-80	28-50	15-30
NaB---------- Nauvoo	0-7	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	7-18	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	18-41	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	41-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
NaD---------- Nauvoo	0-9	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	9-32	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	32-46	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	46-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NbD:											
Nauvoo	0-4	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	4-17	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	17-40	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	40-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
NbF:											
Nauvoo	0-12	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	12-23	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	23-46	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	46-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
NCR:											
Nauvoo	0-6	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	6-16	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	16-52	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	52-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
NCS:											
Nauvoo	0-5	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	5-16	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	16-48	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	48-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
NET:											
Nauvoo	0-4	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	4-16	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	16-41	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	41-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Townley	0-3	Loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	3-36	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NgC---------- Nella	0-9	Gravelly sandy loam.	ML, CL, GM, SM	A-4, A-2	0-10	65-90	60-80	55-65	30-55	<30	NP-8
	9-70	Cobbly clay loam, gravelly clay loam, cobbly sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-2	0-30	75-95	60-90	45-70	30-60	25-40	6-20
NtD:											
Nella----------	0-4	Gravelly sandy loam.	ML, CL, GM, SM	A-4, A-2	0-10	65-90	60-80	55-65	30-55	<30	NP-8
	4-60	Cobbly clay loam, gravelly clay loam, cobbly sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-2	0-30	75-95	60-90	45-70	30-60	25-40	6-20
Townley---------	0-5	Loam----------	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	5-30	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	30-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Pd: Pits and Dumps.											
RNT: Rock outcrop.											
Nella----------	0-16	Gravelly sandy loam.	ML, CL, GM, SM	A-4, A-2	0-10	65-90	60-80	55-65	30-55	<30	NP-8
	16-60	Cobbly clay loam, gravelly clay loam, cobbly sandy clay loam.	CL, SC, CL-ML, SM-SC	A-4, A-6, A-2	0-30	75-95	60-90	45-70	30-60	25-40	6-20
RNT: Townley---------	0-9	Loam----------	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	9-26	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	26-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TaA---------- Tanyard	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-95	60-85	20-40	4-20
	6-10	Loam, silt loam, clay loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	90-100	85-100	50-80	20-40	4-20
	10-59	Silt loam, loam, silty clay loam.	CL, ML	A-6, A-7	0	95-100	90-100	85-100	60-85	32-50	12-28
	59-72	Sandy clay loam, clay loam, loam.	SC, CL, SM	A-4, A-6, A-7	0	95-100	85-100	80-95	40-70	26-48	7-24
TbC---------- Tasso	0-5	Sandy loam-------	SM, SM-SC	A-1, A-2	0-5	90-100	80-95	50-65	20-35	<20	NP-5
	5-25	Silt loam, loam, silty clay loam.	CL	A-4, A-6	0-5	90-100	80-95	75-90	65-80	27-36	9-15
	25-65	Silty clay loam, clay loam, cherty silty clay loam.	CL	A-4, A-6	0-5	70-100	65-95	60-90	50-85	27-36	9-15
TcA---------- Toccoa	0-9	Sandy loam-------	SM	A-2, A-4	0	95-100	95-100	85-100	25-50	<30	NP-4
	9-65	Sandy loam, loam	SM, ML	A-2, A-4	0	95-100	90-100	60-100	30-55	<30	NP-4
TeB---------- Townley	0-4	Silt loam--------	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	4-25	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	25-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TeD--Townley	0-5	Silt loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	5-31	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	31-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
TgF--Townley	0-4	Gravelly loam	ML, CL, CL-ML	A-2, A-4	0-15	50-95	35-75	30-70	30-60	<30	NP-10
	4-24	Silty clay loam, silty clay, clay.	CL, ML, CH, MH	A-7	0-2	75-95	65-80	60-80	55-75	40-64	14-34
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
TNR:											
Townley	0-4	Loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	4-27	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	27-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Nauvoo	0-8	Sandy loam	SM-SC, CL-ML, SC, CL	A-4, A-2	0-3	90-100	85-100	55-93	30-60	<30	NP-8
	8-42	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	42-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
UtB: Urban land.											
Townley	0-5	Silt loam	ML, CL, CL-ML	A-4	0-2	80-98	70-95	65-90	50-65	16-35	NP-10
	5-31	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-7	0-2	75-95	65-95	60-92	55-90	40-72	14-34
	31-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
WaA--Wax	0-9	Loam	SM, SM-SC, ML, CL-ML	A-4	0	95-98	80-97	60-80	45-70	<30	NP-7
	9-25	Clay loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	95-98	80-97	65-85	60-75	23-35	6-18
	25-65	Cherty clay loam, cherty loam, cherty sandy clay loam.	GM-GC, SM-SC, GC, SC	A-2-4, A-4, A-1-B	0-5	25-75	15-70	15-55	15-45	20-30	4-10
WyB--Waynesboro	0-8	Sandy loam	ML, CL-ML, CL, SM	A-4	0-5	85-100	80-100	70-95	43-70	16-29	2-9
	8-23	Clay loam, loam, sandy clay loam.	CL, ML, SC	A-4, A-6, A-7	0-5	90-100	85-100	75-95	45-75	30-41	9-17
	23-60	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
WyD--Waynesboro	0-5	Sandy loam	ML, CL-ML, CL, SM	A-4	0-5	85-100	80-100	70-95	43-70	16-29	2-9
	5-18	Clay loam, loam, sandy clay loam.	CL, ML, SC	A-4, A-6, A-7	0-5	90-100	85-100	75-95	45-75	30-41	9-17
	18-60	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 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cm³	In/hr	In/in	pH				Pct
AeB	0-5	6-25	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.15	5	.5-1
Allen	5-60	18-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.20		
AeD	0-8	6-25	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.15	5	.5-1
Allen	8-65	18-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.20		
CaB, CaD	0-5	7-18	1.45-1.65	0.6-2.0	0.10-0.18	5.6-6.5	Low	0.28	3	<1
Cane	5-25	18-35	1.55-1.75	0.6-2.0	0.14-0.19	4.5-6.0	Low	0.37		
	25-62	18-35	1.60-1.80	0.06-0.2	0.05-0.08	4.5-6.0	Low	0.37		
ChA	0-6	7-25	1.40-1.65	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.32	5	1-3
Choccolocco	6-56	25-35	1.40-1.60	0.6-2.0	0.15-0.20	4.5-6.0	Low	0.37		
	56-72	10-30	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low	0.32		
CoB:										
Conasauga	0-4	8-22	1.30-1.60	0.6-2.0	0.16-0.20	3.6-6.0	Low	0.43	2	<1
	4-24	35-60	1.10-1.35	0.06-0.2	0.12-0.18	3.6-6.0	Moderate	0.32		
	24-60	---	---	---	---	---	---	---		
Firestone	0-6	15-45	1.30-1.60	0.6-2.0	0.13-0.19	4.5-5.5	Low	0.37	3	<1
	6-33	60-75	1.10-1.35	0.06-0.2	0.11-0.16	4.5-5.5	High	0.32		
	33-60	---	---	---	---	---	---	---		
DeB, DeD	0-4	17-27	1.35-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low	0.32	5	1-2
Dewey	4-32	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Moderate	0.24		
	32-65	45-60	1.50-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Moderate	0.24		
DwC3	0-6	32-45	1.40-1.50	0.6-2.0	0.14-0.19	4.5-5.5	Low	0.24	5	<1
Dewey	6-30	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Moderate	0.24		
	30-60	45-60	1.50-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Moderate	0.24		
EmA	0-11	19-35	1.30-1.55	0.6-2.0	0.17-0.21	5.1-6.0	Low	0.37	5	1-4
Emory	11-39	20-35	1.25-1.50	0.6-2.0	0.17-0.21	5.1-6.0	Low	0.37		
	39-65	27-45	1.20-1.55	0.6-2.0	0.16-0.20	5.1-6.0	Low	0.37		
FcD:										
Firestone	0-6	15-45	1.30-1.60	0.6-2.0	0.13-0.19	4.5-5.5	Low	0.37	3	<1
	6-33	60-75	1.10-1.35	0.06-0.2	0.11-0.16	4.5-5.5	High	0.32		
	33-60	---	---	---	---	---	---	---		
Conasauga	0-4	8-22	1.30-1.60	0.6-2.0	0.16-0.20	3.6-6.0	Low	0.43	2	<1
	4-24	35-60	1.10-1.35	0.06-0.2	0.12-0.18	3.6-6.0	Moderate	0.32		
	24-60	---	---	---	---	---	---	---		
GaA	0-11	20-30	1.40-1.60	0.06-0.6	0.16-0.19	3.6-6.0	Moderate	0.37	4	.5-1
Gaylesville	11-25	35-55	1.30-1.60	0.06-0.2	0.14-0.19	3.6-6.0	Moderate	0.28		
	25-60	40-55	1.20-1.50	0.06-0.2	0.14-0.17	3.6-6.0	Moderate	0.28		
HoB	0-7	10-25	1.35-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.28	5	.5-1
Holston	7-60	18-35	1.40-1.55	0.6-2.0	0.13-0.20	4.5-5.5	Low	0.32		
LoA	0-4	12-25	1.30-1.45	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.28	5	1-3
Lobelville	4-23	18-35	1.35-1.50	0.6-2.0	0.08-0.13	4.5-6.0	Low	0.28		
	23-65	18-35	1.35-1.50	0.6-2.0	0.06-0.14	4.5-6.0	Low	0.28		
McB, McD	0-9	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-1
Minvale	9-65	25-45	1.40-1.55	0.6-2.0	0.08-0.14	4.5-5.5	Low	0.28		
MdF:										
Minvale	0-6	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-1
	6-60	25-45	1.40-1.55	0.6-2.0	0.08-0.14	4.5-5.5	Low	0.28		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
MdF:										
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	1-2
	4-14	35-50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Moderate	0.24		
	14-60	45-60	1.50-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Moderate	0.24		
MEB:										
Minvale	0-12	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-1
	12-60	25-45	1.40-1.55	0.6-2.0	0.08-0.14	4.5-5.5	Low	0.28		
Bodine	0-12	8-20	1.35-1.55	2.0-6.0	0.07-0.12	3.6-5.5	Low	0.28	5	<1
	12-60	23-38	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low	0.28		
MNB:										
Minvale	0-8	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-1
	8-60	25-45	1.40-1.55	0.6-2.0	0.08-0.14	4.5-5.5	Low	0.28		
Nella	0-10	12-25	1.30-1.45	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.15	5	.5-1
	10-60	22-35	1.35-1.55	0.6-2.0	0.08-0.15	4.5-5.5	Low	0.15		
Bodine	0-12	8-20	1.35-1.55	2.0-6.0	0.07-0.12	3.6-5.5	Low	0.28	5	<1
	12-60	23-38	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low	0.28		
MNT:										
Minvale	0-7	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-1
	7-60	25-45	1.40-1.55	0.6-2.0	0.08-0.14	4.5-5.5	Low	0.28		
Nella	0-10	12-25	1.30-1.45	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.15	5	.5-1
	10-60	22-35	1.35-1.55	0.6-2.0	0.08-0.15	4.5-5.5	Low	0.15		
Townley	0-4	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	4-30	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	30-60	---	---	---	---	---	---	---		
MvA	0-5	5-27	1.40-1.50	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.37	5	1-4
Mooreville	5-47	18-35	1.40-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.28		
	47-60	10-40	---	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.28		
NaB	0-7	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-2
Nauvoo	7-18	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	18-41	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	41-60	---	---	---	---	---	---	---		
NaD	0-9	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-2
Nauvoo	9-32	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	32-46	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	46-60	---	---	---	---	---	---	---		
NbD:										
Nauvoo	0-4	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-2
	4-17	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	17-40	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	40-60	---	---	---	---	---	---	---		
Rock outcrop.										
NbF:										
Nauvoo	0-12	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-2
	12-23	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	23-46	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	46-60	---	---	---	---	---	---	---		
Rock outcrop.										

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
NCR:										
Nauvoo	0-6	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-1
	6-16	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	16-52	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	52-60	---	---	---	---	---	---	---		
Rock outcrop.										
NCS:										
Nauvoo	0-5	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-1
	5-16	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	16-48	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	48-60	---	---	---	---	---	---	---		
Rock outcrop.										
NET:										
Nauvoo	0-4	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-1
	4-16	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	16-41	15-30	1.30-1.60	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.32		
	41-60	---	---	---	---	---	---	---		
Townley	0-3	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	3-36	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	36-60	---	---	---	---	---	---	---		
NgC	0-9	12-25	1.30-1.45	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.15	5	.5-1
Nella	9-70	22-35	1.35-1.55	0.6-2.0	0.08-0.15	4.5-5.5	Low	0.15		
NtD:										
Nella	0-4	12-25	1.30-1.45	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.15	5	.5-1
	4-60	22-35	1.35-1.55	0.6-2.0	0.08-0.15	4.5-5.5	Low	0.15		
Townley	0-5	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	5-30	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	30-60	---	---	---	---	---	---	---		
Pd:										
Pits and Dumps.										
RNT:										
Rock outcrop.										
Nella	0-16	12-25	1.30-1.45	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.15	5	.5-1
	16-60	22-35	1.35-1.55	0.6-2.0	0.08-0.15	4.5-5.5	Low	0.15		
Townley	0-9	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	9-26	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	26-60	---	---	---	---	---	---	---		
TaA	0-6	10-25	1.35-1.75	0.6-2.0	0.15-0.22	5.1-6.0	Low	0.32	5	.5-2
Tanyard	6-10	15-25	1.40-1.80	0.6-2.0	0.15-0.22	4.5-6.0	Low	0.32		
	10-59	18-35	1.40-1.65	0.6-2.0	0.15-0.22	4.5-6.0	Low	0.28		
	59-72	15-30	1.35-1.70	0.2-2.0	0.12-0.18	5.6-7.8	Low	0.24		
TbC	0-5	8-20	1.35-1.50	2.0-6.0	0.08-0.13	4.5-5.5	Low	0.24	4	.5-1
Tasso	5-25	20-35	1.40-1.55	0.6-2.0	0.17-0.19	4.5-5.5	Low	0.32		
	25-65	20-35	1.50-1.70	0.2-2.0	0.10-0.15	4.5-5.5	Low	0.32		
TcA	0-9	2-15	1.40-1.55	2.0-6.0	0.09-0.12	5.1-6.5	Low	0.10	4	1-2
Toccoa	9-65	2-19	1.40-1.50	2.0-6.0	0.09-0.12	5.1-6.5	Low	0.10		
TeB	0-4	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
Townley	4-25	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	25-60	---	---	---	---	---	---	---		
TeD	0-5	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
Townley	5-31	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	31-60	---	---	---	---	---	---	---		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
TgF	0-4	10-27	1.30-1.60	0.6-2.0	0.10-0.14	3.6-5.5	Low	0.28	3	<1
Townley	4-24	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	24-60	---	---	---	---	---	---	---		
TNR:										
Townley	0-4	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	4-27	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	27-60	---	---	---	---	---	---	---		
Nauvoo	0-8	10-25	1.30-1.60	2.0-6.0	0.13-0.17	4.5-6.0	Low	0.28	3	.5-1
	8-42	18-35	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.32		
	42-60	---	---	---	---	---	---	---		
UtB:										
Urban land.										
Townley	0-5	10-27	1.30-1.60	0.6-2.0	0.12-0.14	3.6-5.5	Low	0.37	3	<1
	5-31	35-60	1.30-1.60	0.06-0.2	0.12-0.18	3.6-5.5	Moderate	0.28		
	31-60	---	---	---	---	---	---	---		
WaA	0-9	12-27	1.35-1.50	0.6-2.0	0.12-0.16	4.5-6.0	Low	0.37	2	1-2
Wax	9-25	20-35	1.40-1.65	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.37		
	25-65	20-35	1.75-1.85	0.06-0.2	0.02-0.05	4.5-5.5	Low	0.15		
WyB	0-8	10-30	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.28	5	.5-2
Waynesboro	8-23	23-35	1.40-1.55	0.6-2.0	0.12-0.16	4.5-5.5	Moderate	0.28		
	23-60	35-50	1.40-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Moderate	0.28		
WyD	0-5	10-30	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.28	5	.5-2
Waynesboro	5-18	23-35	1.40-1.55	0.6-2.0	0.12-0.16	4.5-5.5	Moderate	0.28		
	18-60	35-50	1.40-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Moderate	0.28		

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AeB, AeD---------- Allen	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
CaB, CaD---------- Cane	C	None--------	---	---	2.0-3.0	Perched	Nov-Mar	>60	---	Moderate	High.
ChA---------- Choccolocco	B	Occasional	Very brief	Nov-Mar	>6.0	---	---	>60	---	Moderate	Moderate.
CoB:											
Conasauga--------	C	None--------	---	---	>6.0	---	---	20-40	Soft	High-----	High.
Firestone--------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
DeB, DeD, DwC3---- Dewey	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
EmA---------- Emory	B	None--------	---	---	+1-0	Perched	Dec-Apr	>60	---	Moderate	Moderate.
FcD:											
Firestone--------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
Conasauga--------	C	None--------	---	---	>6.0	---	---	20-40	Soft	High-----	High.
GaA---------- Gaylesville	D	Frequent----	Brief-----	Nov-Apr	0-1.5	Apparent	Nov-Mar	>60	---	High-----	High.
HoB---------- Holston	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
LoA---------- Lobelville	C	Frequent----	Very brief	Dec-Apr	2.0-3.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
McB, McD---------- Minvale	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
MdF:											
Minvale----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Dewey----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
MEB:											
Minvale----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Bodine----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
MNB:											
Minvale----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Nella----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Bodine----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
MNT:											
Minvale----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low.
Nella----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Townley----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
MvA---------- Mooreville	C	Frequent----	Brief-----	Jan-Mar	1.5-3.0	Apparent	Jan-Mar	>60	---	Moderate	High.
NaB, NaD---------- Nauvoo	B	None--------	---	---	>6.0	---	---	40-60	Soft	Low------	High.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
NbD, NbF, NCR, NCS: Nauvoo	B	None	---	---	>6.0	---	---	40-60	Soft	Low	High.
Rock outcrop.											
NET: Nauvoo	B	None	---	---	>6.0	---	---	40-60	Soft	Low	High.
Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
NgC--Nella	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
NtD: Nella	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
Pd: Pits and Dumps.											
RNT: Rock outcrop.											
Nella	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
TaA--Tanyard	C	Frequent	Very brief to brief.	Dec-Apr	1.5-2.5	Apparent	Dec-Apr	>60	---	Moderate	Moderate.
TbC--Tasso	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
TcA--Toccoa	B	Occasional	Brief	Dec-Apr	2.5-5.0	Apparent	Dec-Apr	>60	---	Low	Moderate.
TeB, TeD, TgF--Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
TNR: Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
Nauvoo	B	None	---	---	>6.0	---	---	40-60	Soft	Low	High.
UtB: Urban land.											
Townley	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
WaA--Wax	C	Occasional	Very brief	Jan-Apr	1.5-3.0	Perched	Dec-Apr	>60	---	Moderate	Moderate.
WyB, WyD--Waynesboro	B	None	---	---	>6.0	---	---	>60	---	High	High.

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS

[The soils in this table are the typical pedons for the series as described in the section "Soil Series and Their Morphology"]

Soil name and sample number	Horizon	Depth	Particle-size distribution (percent less than 2 mm)		
			Total sand (2.0-0.05 mm)	Total silt (0.05-0.002 mm)	Total clay (<0.002 mm)
Cane loam:					
(S78AL-115-3)	Ap	0-5	44.1	37.8	18.1
	Bt1	5-10	40.1	34.6	25.3
	Bt2	10-25	46.6	30.9	22.5
	Bx1	25-37	49.9	26.7	23.4
	Bx2	37-62	53.0	25.0	22.0
Firestone silt loam:					
(S78AL-115-2)	A	0-3	20.5	58.9	20.6
	BA	3-6	9.6	65.9	24.5
	Bt1	6-25	2.9	26.7	70.4
	Bt2	25-33	6.6	43.8	49.6
Tanyard silt loam:					
(S78AL-115-9)	Ap	0-6	22.8	63.3	13.9
	Bt1	6-10	28.6	50.1	21.3
	Bt2	10-22	34.9	45.7	19.4
	Bt3	22-30	32.8	46.6	20.6
	Bt4	30-59	40.7	43.3	16.0
	Bt5	59-72	53.6	24.5	21.9
Wax loam:					
(S78AL-115-5)	A	0-5	47.6	44.5	7.9
	BE	5-9	43.1	45.1	11.8
	Bt	9-25	35.2	46.7	18.1
	Bx1	25-35	52.7	19.6	27.7
	Bx2	35-65	55.7	14.6	29.7

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS

[The soils in this table are the typical pedons for the series as described in the section "Soil Series and Their Morphology"]

Soil name and sample number	Horizon	Depth	Reaction 1:1 (soil to water)	Extractable bases			Base saturation
				Calcium	Magnesium	Potassium	
		In	pH	Milliequivalents per 100 grams			Pct
Cane loam:							
(S78AL-115-3)	Ap	0-5	5.6	2.10	0.59	0.17	62
	Bt1	5-10	5.1	1.17	0.40	0.07	35
	Bt2	10-25	5.2	1.05	0.28	0.05	52
	Bx1	25-37	4.9	0.37	0.10	0.05	19
	Bx2	37-62	5.1	0.27	0.09	0.07	10
Firestone silt loam:							
(S78AL-115-2)	A	0-3	5.4	2.64	0.43	0.12	55
	BA	3-6	4.9	2.32	0.16	0.03	25
	Bt1	6-25	5.0	8.95	1.02	0.14	28
	Bt2	25-33	5.2	13.35	1.07	0.16	66
Tanyard silt loam:							
(S78AL-115-9)	Ap	0-6	5.7	5.59	0.59	0.06	63
	Bt1	6-10	5.8	2.67	0.31	0.05	45
	Bt2	10-22	4.8	1.24	0.18	0.03	22
	Bt3	22-30	4.9	0.74	0.23	0.04	15
	Bt4	30-59	5.7	2.57	0.73	0.05	53
	Bt5	59-72	6.8	6.42	1.22	0.06	75
Wax loam:							
(S78AL-115-5)	A	0-5	4.8	0.60	0.13	0.08	16
	BE	5-9	4.8	0.27	0.08	0.04	16
	Bt	9-25	4.8	0.37	0.18	0.03	28
	Bx1	25-35	4.7	0.37	0.26	0.03	16
	Bx2	35-65	4.8	0.27	0.25	0.04	9

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Allen	Fine-loamy, siliceous, thermic Typic Paleudults
Bodine	Loamy-skeletal, siliceous, thermic Typic Paleudults
Cane	Fine-loamy, siliceous, thermic Typic Fragiudults
Choccolocco	Fine-silty, mixed, thermic Typic Hapludults
Conasauga	Fine, mixed, thermic Typic Hapludalfs
Dewey	Clayey, kaolinitic, thermic Typic Paleudults
Emory	Fine-silty, siliceous, thermic Fluventic Umbric Dystrochrepts
Firestone	Very-fine, mixed, thermic Typic Hapludalfs
Gaylesville	Fine, mixed, thermic Aeric Ochraqualfs
Holston	Fine-loamy, siliceous, thermic Typic Paleudults
Lobelville	Fine-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Minvale	Fine-loamy, siliceous, thermic Typic Paleudults
Mooreville	Fine-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Nauvoo	Fine-loamy, siliceous, thermic Typic Hapludults
Nella	Fine-loamy, siliceous, thermic Typic Paleudults
Tanyard	Fine-loamy, siliceous, thermic Aquultic Hapludalfs
Tasso	Fine-loamy, siliceous, thermic Fragic Paleudults
Toccoa	Coarse-loamy, mixed, nonacid, thermic Typic Udifluvents
Townley	Clayey, mixed, thermic Typic Hapludults
Wax	Fine-loamy, siliceous, thermic Typic Fragiudults
Waynesboro	Clayey, kaolinitic, thermic Typic Paleudults

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