Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber (fig. 24). Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses (USDA 1975, 1985, 1993). It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land, public land not available for farming, or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 101,455 acres, or nearly 28 percent, of Breckinridge County and about 39,330 acres, or nearly 19 percent, of Meade County meet the soil requirements for prime farmland. Scattered areas of this prime farmland are throughout the survey area, but most are in general soil map units 1, 2, 4, 5, and 8 in Breckinridge County and in general soil map units 1, 2, 3, 4, 5, 8, and 9 in Meade County. The general soil map units are described under the heading "General Soil Map Units."

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

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

The map units that meet the requirements for prime farmland are:

AlB2 Alford silt loam, 2 to 6 percent slopes, eroded
BaB2 Baxter very gravelly silt loam, karst, 2 to 6 percent slopes, eroded
Cn Chagrin fine sandy loam, occasionally flooded
Co Clifty gravelly silt loam, occasionally flooded
CrB2 Crider silt loam, 2 to 6 percent slopes, eroded
Cu Cuba silt loam, occasionally flooded
EkA Elk silt loam, 0 to 2 percent slopes
EkB Elk silt loam, 2 to 6 percent slopes
GaB2 Gatton silt loam, 2 to 6 percent slopes, eroded
HaB2 Hammack silt loam, 2 to 6 percent slopes, eroded
HoB2 Hosmer silt loam, 2 to 6 percent slopes, eroded
Hu Huntington silt loam, occasionally flooded
Ld Lindside silt loam, occasionally flooded
Ln Lindside silt loam, depressional, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Mc McGary silt loam (where drained)
Me Melvin silt loam, occasionally flooded (where drained)

Figure 24.—An area of Huntington silt loam, occasionally flooded, which is prime farmland, used to produce corn. Prime farmland soils are important for providing both food and fiber.

Mf Melvin silt loam, depressional, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
Na Newark silt loam, occasionally flooded (where drained)
Ne Newark silt loam, depressional, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
NhB2 Nicholson silt loam, 2 to 6 percent slopes, eroded
No Nolin silt loam, occasionally flooded
Nv Nolin silt loam, depressional, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
PeA Pekin silt loam, 0 to 2 percent slopes
PeB Pekin silt loam, 2 to 6 percent slopes
Rf Robbs silt loam (where drained)
SaA Sadler silt loam, 0 to 2 percent slopes
SaB2 Sadler silt loam, 2 to 6 percent slopes, eroded
ScA Sciotoville silt loam, 0 to 2 percent slopes
ScB Sciotoville silt loam, 2 to 6 percent slopes
Sf Steff silt loam, occasionally flooded
St Stendal silt loam, occasionally flooded (where drained)
We Weinbach silt loam (where drained)
WxB Wheeling fine sandy loam, 2 to 6 percent slopes
ZaB2 Zanesville silt loam, 2 to 6 percent slopes, eroded

Use and Management of the Soils

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

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

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

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

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, the seasonal high water table, 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, Pasture, and Hayland

William H. Amos, Jr., agronomist, Carl W. Hail, assistant state soil scientist, and Calvin R. Bohannon, district conservationist, Natural Resources Conservation Service, helped to prepare this section.

General management needed for crops, pasture, and hayland is suggested in this section. The crops or pasture and hayland 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 Natural Resources 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 the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

More than 303,200 acres in the survey area was used for crops and pasture in 1982 (USDA 1982). Of this total, more than 100,700 acres was used for permanent pasture and 202,500 acres was used as cropland. The major row crops and close-growing crops are tobacco, feed grain, soybeans, and small grain. Specialty crops, such as bell peppers and tomatoes, are grown to supplement farm income. The acreages of major crops grown in 1987 included 108,000 acres of row crops, including corn, soybeans, and tobacco; 15,000 acres of close-grown crops, mainly wheat; and 40,000 acres of hay (U.S. Department of Commerce 1989). In recent years Federal set-aside and conservation reserve programs have had a positive impact in the conservation of land and water resources. The conservation of soils on marginal lands was enhanced by the shift away from crop production on a continuous or rotation basis. A permanent cover of grasses and legumes is being

established on much of this land. As a result, landowners will benefit from added tons of forage production from pasture and hayland and they will have the opportunity to increase livestock numbers.

Managing Cropland

The soils in the survey area have the potential for increased crop production. In 1982, about 59,400 acres of land in capability classes II to IV was used for pasture and hayland, about 62,500 acres was used for woodland, and about 8,200 acres was idle or was land that had previously been used for cultivated crops. A recent trend has been that this potentially highly productive land is being converted to urban and built-up areas in the north-central and northeastern parts of Meade County and near Hardinsburg in Breckinridge County. In 1982, an estimated 36,900 acres of urban and built-up land was in Breckinridge and Meade Counties. The shift to urban uses is not as significant in the survey area as compared to that in adjacent counties. As the population of the survey area grows and mobility continues to increase, however, farmers in affected areas may have to use less productive, marginal land for crop production.

Soil erosion is a major problem on most of the cropland and pasture in the survey area. If slope is more than 2 percent, erosion is a hazard. Except for some of the nearly level flood plains, stream terraces, and broad, flat ridgetops, nearly all of the cropland and pasture in Breckinridge and Meade Counties is gently sloping to steep and thus is subject to erosion.

Loss of the surface layer through erosion is damaging for three reasons. First, productivity is reduced as organic matter and nutrients are lost and as part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on Lenberg, Caneyville, Baxter, and other soils that have a clayey subsoil. Second, erosion further limits the depth of the root zone in soils that have a restrictive layer in or below the subsoil or that are shallow or moderately deep to bedrock. These soils include the Sadler, Sciotoville, Weinbach, and Zanesville soils, which have a fragipan, and the Caneyville, Gilpin, and Fredonia soils, which are moderately deep to bedrock. Third, erosion results in the pollution of ponds, lakes, and streams by sediment. This pollution impairs the quality of water for municipal and recreational uses and for livestock, fish, and wildlife.

Erosion-control practices help to provide a protective surface cover, reduce the rate of runoff, and increase the rate of infiltration. A conservation cropping system that keeps a vegetative cover or crop residue on the surface for extended periods helps to keep soil erosion losses at an acceptable level and maintain the productivity of the soils. Including grass and legume forage crops in the cropping system helps to control erosion on sloping soils used for pasture and hayland on livestock farms. These grasses and legumes also help to provide nitrogen and improve tilth for the row crops grown in rotation.

Conservation tillage helps to increase the rate of infiltration, reduce the rate of runoff, and control erosion. It can be adapted to most of the soils in Breckinridge and Meade Counties. No-till planting of corn, soybeans, and small grain is popular in the survey area. About 90 percent of the ground cover is left on the surface after no-till planting of row crops. This ground cover helps to control erosion on sloping cropland. No-tillage, minimum tillage, and other conservation tillage methods are continuing to increase in practice as farmers learn and apply new technology to control weeds, insects, and diseases.

Terraces or diversions, or a combination of both, can be used to reduce the length of slope. They also channel runoff into stable outlets, such as grassed waterways, and thus help to control erosion. Terraces and diversions are most practical on deep, well drained soils that have uniform slopes. Crider and Elk soils are suited to terraces. Baxter, Fredonia, Gilpin, Sadler, and other soils are less suited to terraces and diversions because they have irregular slopes, a clayey subsoil, a fragipan that would be exposed in terrace channels, or bedrock at a depth of less than 40 inches.

Farming on the contour and contour stripcropping also help to control erosion. They are best suited on soils that have smooth, uniform slopes. Most areas of the gently sloping and sloping Crider, Elk, Fredonia, Caneyville, Nicholson, Rosine, Sadler, and Zanesville soils are suited to these practices.

Soil drainage is the main management concern on about 3 percent of the acreage used for crops and pasture in the survey area. Some soils are so wet that the production of crops commonly grown in the area generally is not possible unless the soils are drained. An example is the poorly drained Melvin soils. Unless somewhat poorly drained soils are drained, planting and harvesting are delayed or the crops are damaged almost every year. Newark, Stendal, McGary, and Robbs soils, which are somewhat poorly drained, occur on about 11,000 acres. The nearly level or level, moderately well drained Sciotoville and Sadler soils have a perched water table and a slow runoff rate. They also tend to dry out slowly in the early part of the growing season. A drainage system is needed in some of the wetter areas of these soils.

The design of both surface and subsurface

drainage systems varies with the kind of soil. A combination of surface and subsurface drains is needed in most areas of poorly drained and somewhat poorly drained soils that are intensively cultivated. Open drainage ditches are more effective than subsurface drains in areas of soils that have a fragipan at a depth of 18 to 24 inches, such as the Robbs soils. Because the fragipan restricts water movement, the subsurface drains would have to be installed in the very slowly permeable section of the soil profile to have adequate cover over them. The fragipan would lower the efficiency of the subsurface drainage system in removing excess water from the field. On soils that do not have a fragipan or that have a fragipan at a depth of more than 24 inches, subsurface drains may be more effective than open ditches in lowering the water table. To be effective, subsurface drains would also have to be spaced closer together in the slowly permeable soils than in the more permeable soils. Both surface and surface drainage systems require a suitable outlet.

Information on the design and application of erosion-control practices and drainage systems for each kind of soil in the survey area is available at the local office of the Natural Resources Conservation Service.

Managing Pasture and Hayland

A successful livestock program depends on a forage program that provides large quantities of good-quality feeds. It can furnish as much as 78 percent of the feed for beef cattle and as much as 66 percent of the feed for dairy cattle (Evans and Lacefield 1977; Evans and others 1978).

In 1982, about 61,600 acres in Breckinridge County and 39,100 acres in Meade County were used for pasture and hayland (USDA 1982). About 20,500 acres in Breckinridge County and 9,400 acres in Meade County need reestablishment. Renovation, brush control, and measures that prevent overgrazing are needed on a fairly large acreage.

The soils in the survey area vary widely in their ability to produce grasses and legumes because of differences in depth to bedrock or to other limiting layers, internal drainage, available water capacity, and many other properties. Grasses, legumes, and grass-legume combinations vary widely in persistence and production on differing soils. The right match of plant species or mixture of plant species and differing soils is needed to produce the greatest yields and maximize soil and water conservation.

The nearly level and gently sloping, deep, well drained soils should be planted to the highest producing crops, such as corn silage, alfalfa, or a mixture of alfalfa and orchardgrass or of alfalfa and timothy. Sod-forming grasses, such as tall fescue and bluegrass, minimize erosion in the steeper areas. Alfalfa should be seeded with cool-season grasses in areas where the soils are at least 2 feet deep and are well drained. The more poorly drained soils and the soils that are less than 2 feet deep are suited to clover-grass mixtures or pure stands of grass. Legumes can be established through renovation in areas that support sod-forming grasses.

The forage species selected for planting should be those that are suited not only to the soil but also to the intended use. They should be those that provide the maximum quality and versatility in the forage program. Legumes generally produce higher quality feed than grasses (fig. 25). As a result, they should be planted to the maximum extent possible. The taller growing legumes, such as alfalfa and red clover, are more versatile than legumes that are used primarily for grazing, such as white clover. Orchardgrass, timothy, and tall fescue are best suited to use as hay and silage.

Tall fescue is an important cool-season grass that is suited to a wide range of soil conditions. It is grown for both pasture and hay. The growth that occurs in August to November is commonly permitted to accumulate in the field and is "stockpiled" for deferred grazing in late fall and in winter. For maximum production, nitrogen fertilizer should be applied during the stockpiling period. The rate of application should be based on the desired production level.

Renovation can increase forage yields in areas that have a good stand of grass. Renovation involves partial destruction of the sod, applications of lime and fertilizer, and seeding of the desirable forage species. Adding legumes to these grass stands provides high-quality feed. Legumes increase summer production. They also take nitrogen from the air. Under growing conditions in Kentucky, alfalfa can fix 200 to 300 pounds of nitrogen per acre per year; red clover can fix 100 to 200 pounds; and ladino clover can fix 100 to 150 pounds. An acre of Korean lespedeza, vetch, and other annual forage legumes can fix 75 to 100 pounds of nitrogen per year (Evans and others 1978).

Some of the important steps in successful renovation and management are as follows—

1. Ensure close grazing or mowing of the pasture before disking or disturbing the sod.
2. Disturb 40 to 60 percent of the plant cover if clover is to be sown and 80 to 100 percent if alfalfa is to be sown. A disk, field cultivator, or field tiller can be used.
3. Perform soil tests and apply the necessary amounts of lime, phosphate, and potash. Do not use

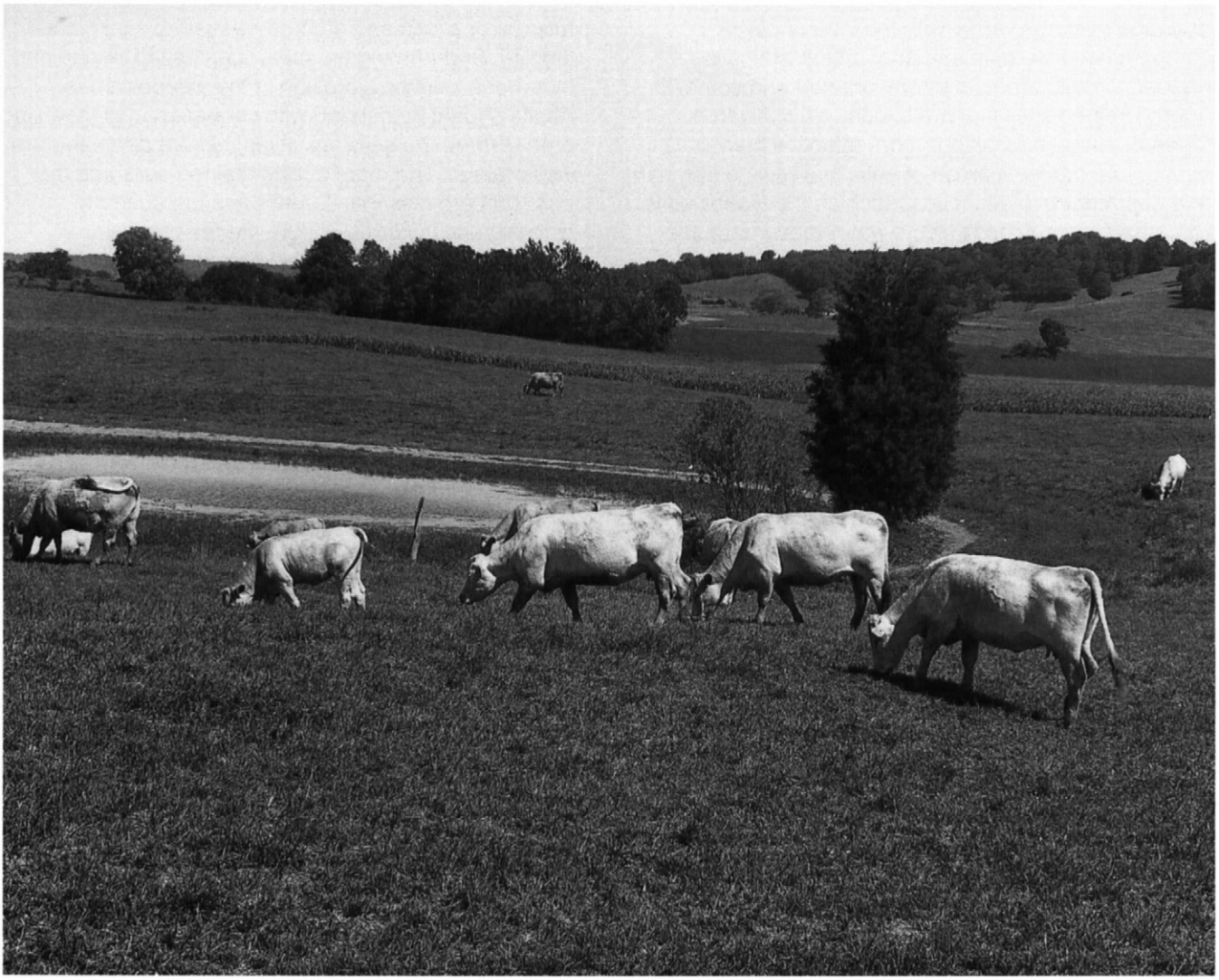

Figure 25.—Cattle grazing a fescue-clover pasture. Adding legumes to the stand produces higher quality feed that results in better animal performance.

nitrogen when renovating old grass fields because it increases grass competition with the legume seedlings.

4. Prepare a smooth, firm seedbed and distribute seed evenly over the area. Cover the seed with about 1/8 to 1/4 inch of soil to ensure a good seed-soil contact.

5. Seed an adapted variety that has a high percentage of germination and inoculate with the proper nitrogen-fixing bacteria.

6. Seed fescue, bluegrass, timothy, orchardgrass, ryegrass, and small grain forage crops in late summer or in early fall. Seed alfalfa, red clover, white clover, and lespedeza in the spring.

7. Keep renovated fields grazed short until livestock begin grazing on the young legumes, then remove livestock and allow the legumes to become established.

8. Control grazing and leave 2 to 3 inches of top growth on established grass-legume pastures.

9. Mow pastures as needed to remove grass seed heads and to control weeds and woody vegetation.

10. Topdress annually with phosphate and potash according to soil tests and add lime to maintain the necessary soil pH for the legume that is being grown.

11. Check renovated fields for insect damage or disease.

For additional information on pasture and hayland management, contact the local office of the Natural

Resources Conservation Service or the Kentucky Cooperative Extension Service.

Yields per Acre

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

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

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

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or 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 (USDA 1961).

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

Class I soils have few limitations that restrict their use.

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

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

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

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability

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

Woodland Management and Productivity

Charles A. Foster, forester, Natural Resources Conservation Service, helped to prepare this section.

Breckinridge and Meade Counties are characterized as rural areas with small- and medium-sized farms. About 40 percent of the land area is mixed hardwood forest. The forest land covers about 152,500 acres, or 42 percent of the land area, in Breckinridge County and about 80,600 acres, or 41 percent of the land area, in Meade County. Oak-hickory is the major forest type in both counties, comprising about 66 percent of the acreage in forest land. Forest types making up the remaining 34 percent are loblolly-shortleaf pine, oak-pine, elm-ash-red maple, maple-beech-birch, and oak-gum-cypress (Kinsley and Powell 1978).

Woodland tracts in the survey area consist of relatively small, generally unmanaged, private holdings. Most of the forest land is capable of producing 50 cubic feet or more of wood per acre per year, but actual growth is about 33 cubic feet per acre per year because many stands are not well stocked with good-quality, desirable trees. About 24 percent of the landowners hold the forest land less than 10 years before reselling the land, and only 9 percent of the landowners use the woodland specifically for timber production. These factors are detrimental to good management.

Good management can improve tree growth, stocking, and the quality of the stands (fig. 26). This management involves removal of low-quality trees in fully stocked and understocked stands and regeneration of sawtimber stands after harvest. The information in this survey can be used to identify the most productive forest land, the soil limitations that affect management, and the most desirable tree species to plant.

The survey area has eight sawmills that produce rough lumber, pulp chips, crossties, pallet cants, and fence boards. Several sawmills in adjacent counties buy logs and standing timber from landowners in the survey area.

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

Figure 26.—Hardwoods in an area of Zanesville silt loam, 2 to 6 percent slopes, eroded. Woodland management practices can improve growth, stocking, and quality of trees.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the

survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, the seasonal high water table, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. The seasonal high water table can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the seasonal high water table restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the seasonal high water table restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, the seasonal high water table, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. 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 (Beck 1962; Boisen and Newlin 1910; Broadfoot 1960, 1963; Broadfoot and Krinard 1959; Coile and Schumacher 1953; Doolittle 1960; Nelson, Clutter, and Chaiken 1961; Olson 1959).

The *volume* is expressed as cubic feet per acre per year. It is the yield likely to be produced by the most important trees. It indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to plant are those that are suitable for commercial wood production.

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 the seasonal high water table, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and

accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

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

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Raymond E. Toor, biologist, Natural Resources Conservation Service, helped to prepare this section.

Wildlife is an important natural resource in the survey area. The great diversity of habitat in the area provides an abundance of animals, fish, and birds for residents and visitors to enjoy. The wildlife population in the counties has been estimated at 45 species of mammals, 65 species of terrestrial reptiles and amphibians, and 105 species of birds that commonly nest in the area. More than 200 other species of birds make seasonal migrations through Kentucky each year. Many of these birds are in the survey area at various times of the year.

The most important wildlife species are those that provide opportunities for sport hunting, trapping, bird watching, and photography. The major game species include gray squirrel, fox squirrel, cottontail rabbit, white-tailed deer, bobwhite quail, mourning dove, raccoon, and eastern wild turkey. Muskrat, beaver, raccoon, mink, red fox, and gray fox are trapped. Bird watchers and photographers are especially interested in those species of birds that are rare or endangered or that are difficult to find or approach.

Many of the soils in the survey area are suitable for impounding water. Ponds, small streams, and large impoundments are stocked and managed for largemouth bass, smallmouth bass, channel catfish, bluegill, walleye, striped bass, and rainbow trout. The Ohio River and the Rough River are the major rivers in the survey area. Clover Creek, Sinking Creek, Yellowbank Creek, Tules Creek, Rock Lick Creek, Otter Creek, and Doe Run are the major tributary streams. Rough River Lake and Doe Run Lake are the major water impoundments that have been constructed in the survey area.

Very little aquaculture exists in Breckinridge and

Meade Counties. Expansion of aquaculture depends on adequate water supplies, improvement of water quality, and marketing.

Waterfowl are common in the survey area during the migration period. The species include mallards, teal, widgeon, and Canada geese. Wood ducks, which are the more permanent residents, nest in the area.

Successful wildlife management on any tract of land requires that food, cover, and water be available in a suitable combination. A lack of any one of these necessities, an unfavorable balance among them, or an inadequate distribution of them may limit the reproduction or dissemination of the desired kinds of wildlife. Soil information is a valuable tool in creating, improving, or maintaining suitable food, cover, and water for wildlife. Soil interpretations for wildlife habitat help in selecting the better suited sites for various kinds of management. They serve as indicators of the intensity of management needed to achieve satisfactory results. They also serve as a means of showing why it generally may not be feasible to manage a particular area for a given kind of wildlife. Interpretations also can be used in the broad-scale planning of wildlife management areas, parks, and nature areas or when acquiring wildlife lands.

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 (Anderson 1951).

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife (Wildlife Management Institute 1963). This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, the seasonal high water table, slope, stones on the surface, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, the seasonal high water table, stones on the surface, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, orchardgrass, bluegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, the seasonal high water table, stones on the surface, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, aster, and tickclover.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and the seasonal high water table. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and the seasonal high water table. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, the seasonal high water table, reaction, slope, and stones on the surface. Examples of wetland plants are smartweed, wild millet, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, the seasonal high water table, stones on the surface, slope, and permeability. Examples of shallow water areas are marshes, ponds, and constructed wetlands.

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, 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, muskrat, mink, and beaver.

Land used as cropland, pastureland, or woodland also furnishes quality habitat for many kinds of wildlife in areas where conservation practices are effectively applied. Examples of these practices are using planned crop rotations, applying good crop residue management, fallowing, spring disking of idle field borders, stripmowing, and leaving small areas of unharvested grain next to areas that have good cover.

Conservation measures generally benefit wildlife in areas of improved pasture. They include carefully planned mechanical mowing, deferred grazing, prescribed grazing systems, selective brush management, and maintaining shrub field borders.

Other conservation practices benefit woodland wildlife. They include clearing and thinning trees selectively; planting winter annuals on right-of-ways of pipelines, in firebreaks, and in open areas; and protecting den trees and quality mast-producing trees.

Proper application of conservation practices should be based on the habitat needs of the wildlife to be managed. If applied arbitrarily, many of these practices could be detrimental rather than beneficial. When managing for game species, many nongame species are also benefited. Contact the Kentucky Department of Fish and Wildlife Resources or the local office of the Kentucky Agricultural Extension Service or the Natural Resources Conservation Service for technical assistance in planning or applying needed wildlife management practices.

Engineering

Donald L. Canary, area engineer, Natural Resources Conservation Service, helped to prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, the seasonal high water table, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay

minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

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

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, 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 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, shrinking and swelling, and organic layers can cause the movement of footings (fig. 27). A high water table,

Figure 27.—The footings of this house shifted during an extended dry period causing the wall to crack. The clayey soil material under the house and the clayey soils throughout the survey area have a moderate shrink-swell potential.

depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock 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, 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, and the available water capacity in the upper 40 inches affect plant growth. Flooding, the seasonal high water table, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

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

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 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. When two or more lagoons are designed in conjunction with each other, the second lagoon is generally anaerobic. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Holding ponds used as sewage lagoons may vary in depth without having level floors. Aerobic lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Anaerobic lagoons, however, generally range in depth from 8 to 14 feet in order to initiate anaerobic digestion. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

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

Excessive seepage resulting from rapid permeability in the soil or a water table that is high

enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. 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 groundwater pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, the seasonal high water table, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

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

Construction Materials

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

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They

are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

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

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways (fig. 28).

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

Figure 28.—A grassed waterway and a cornfield in an area of Sadler silt loam, 2 to 6 percent slopes, eroded. Where suitable, grassed waterways provide for the safe flow of water across fields with minimal loss of soil.

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; and subsidence of organic layers. 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 sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, the seasonal high water table, 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 erosion 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, the seasonal high water table, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of erosion, low available water capacity, restricted rooting depth, 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. These results are reported in table 21.

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 (Macneal unpublished; USDA 1967; University of Kentucky 1986, 1991). Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

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

Engineering Index Properties

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

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

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

Classification of the soils is determined according to the Unified soil classification system (ASTM 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO 1986).

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

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

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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 21.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates

determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

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

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields (Uhland and O'Neal 1951).

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

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture

content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water (USDA 1978).

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

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

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Examples are Lakin and Yeager soils.

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. Examples are Elk, Huntington, Rosine, and Wheeling soils.

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. Examples are Caneyville, Lenberg, Nicholson, Sadler, and Zanesville soils.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Examples are Corydon, Robbs, and Melvin soils.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable period of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *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 7 days to 1 month. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated

zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The second numeral in the range indicates the depth below the surface. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Kentucky Agricultural Experiment Station, Lexington, Kentucky.

Most determinations, except those for grain-size analysis and bulk density, 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 (USDA 1996).

Coarse materials—(2-75 mm fraction) weight estimates of the percentages of all material less than 75 mm (3B1).
Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).
Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).
Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).
Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).
Extractable cations—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2b), potassium (6Q2b).
Extractable acidity—barium chloride-triethanolamine IV (6H5a).
Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).
Cation-exchange capacity—sum of cations (5A3a).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—1:1 water dilution (8C1f).
Available phosphorus (6S3).
Field sampling—site selection (1A1).
Field sampling—pedon sampling (1A2).
Laboratory preparation—standard (air-dry) material (1B1).

Particles—(specified size) 2 mm (2A2).
Particles—less than 2 mm (2A1).
Data sheet symbols (2B).
Particles—greater than 2 mm by field or laboratory weighing (3B1a).
Extractable bases (5B1a).
Calcium carbonate equivalent (6E1).

Mineralogy of Selected Soils

The results of mineralogy determinations of several typical pedons are given in tables 19 and 20. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were analyzed by the Kentucky Agricultural Experiment Station, Lexington, Kentucky.

The determinations in table 19 were made by the optical count method on the coarse silt and fine sand fraction. The determinations in table 20 were made on clay particles. The methods used in obtaining the data are optical analyses (7B1) and x-ray diffraction (7A2i). The codes in parentheses refer to published methods (USDA 1996).

Engineering Index Test Data

Table 21 shows laboratory test data for two pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the Natural Resources Conservation Service, Soil Mechanics Laboratory, Fort Worth, Texas.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); Moisture density—T 99 (AASHTO), D 698 (ASTM); and Specific gravity—T 100 (AASHTO), D 854 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA 1966, 1975). 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 22 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning udic moisture regime (humid), plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Paleudalfs (*Pale*, meaning excessive development, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Paleudalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, mesic Typic Paleudalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The Crider series is an example.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA 1975) and in "Keys to Soil Taxonomy" (USDA 1992). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Alford Series

The Alford series consists of very deep, well drained soils that are moderately permeable. These soils formed in more than 4 feet of loess. They are on ridgetops and side slopes above the Ohio River valley

in the northern part of the survey area. Slopes range from 2 to 20 percent. The soils are fine-silty, mixed, mesic Typic Hapludalfs.

Alford soils are on the same landscape as Hosmer, Crider, Wheeling, and Elk soils. Hosmer soils have a fragipan. Crider soils are on adjacent uplands. They formed in a thin mantle of loess and in the underlying limestone residuum. Wheeling and Elk soils are on adjacent stream terraces. They formed in alluvium.

Typical pedon of Alford silt loam, 6 to 12 percent slopes, eroded; in Breckinridge County; about 2 miles west of Stephensport on Kentucky Highway 144, about 0.5 mile southeast of Addison, and 1,000 feet south of the highway; in a hayfield; soil map sheet 28:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; very friable; common fine roots; neutral; abrupt smooth boundary.

BA—9 to 12 inches; strong brown (7.5YR 5/6) silt loam; weak fine and medium subangular blocky structure; friable; common distinct brown (10YR 4/3) organic coatings on faces of peds and in root channels; common fine roots; neutral; clear smooth boundary.

Bt1—12 to 28 inches; strong brown (7.5YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; many prominent yellowish red (5YR 4/6) clay films on faces of peds; few fine roots; few fine pores; moderately acid; clear smooth boundary.

Bt2—28 to 45 inches; yellowish brown (10YR 5/4) silt loam; moderate fine and medium subangular blocky structure; friable; common prominent yellowish red (5YR 4/6) clay films on faces of peds; few fine roots; moderately acid; gradual smooth boundary.

Bt3—45 to 55 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; very friable; few distinct strong brown (7.5YR 5/6) clay films on faces of peds; few prominent dark brown nodules and stains of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt4—55 to 72 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; common prominent black nodules and stains of iron and manganese oxide; moderately acid.

The thickness of the solum ranges from 60 to 80 inches. The thickness of the loess ranges from 48 to more than 60 inches. Reaction ranges from strongly acid to neutral in the solum and from very strongly acid to neutral in the substratum.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. Pedons in undisturbed areas have a thin A horizon. This thin horizon has hue similar to that of the Ap horizon. It has value of 3 or 4 and chroma of 1 or 2. It is underlain by an E horizon, which has value of 4 or 5 and chroma of 3 or 4.

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

The Bt1, Bt2, and Bt3 horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. They are silt loam or silty clay loam.

The Bt4 horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam.

Baxter Series

The Baxter series consists of very deep, well drained soils that are moderately permeable. These soils formed in clayey material weathered from cherty limestone (fig. 29). They are on ridgetops and side slopes of karst limestone uplands in the central and eastern parts of Meade County. Slopes range from 2 to 30 percent. The soils are fine, mixed, mesic Typic Paleudalfs.

Baxter soils are on the same landscape as Crider, Nicholson, Hammack, Fredonia, and Nolin soils. Crider, Nicholson, and Hammack soils have a fine-silty control section that contains less than 15 percent chert fragments. Also, Nicholson soils have a fragipan. Fredonia soils are moderately deep to bedrock. Nolin soils are on adjacent alluvial flood plains and in karst basins on uplands.

Typical pedon of Baxter very gravelly silt loam, karst, 12 to 20 percent slopes, eroded; in Meade County; about 2 miles south of Lickskillet on Kentucky Highway 1238, about 1,300 feet east on Pack Lane, and 800 feet south of the lane; in a cultivated field; soil map sheet 26:

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) very gravelly silt loam; weak fine and medium subangular blocky structure parting to moderate fine and medium granular; firm; common fine and medium roots; 44 percent angular pebbles 0.1 inch to 3 inches across; moderately acid; abrupt wavy boundary.

Bt1—5 to 11 inches; yellowish red (5YR 5/6) gravelly silty clay; moderate medium angular and subangular blocky structure; firm; few fine roots;

common distinct clay films on faces of peds; 23 percent angular pebbles 0.1 inch to 3 inches across; strongly acid; clear wavy boundary.

Bt2—11 to 20 inches; red (2.5YR 4/6) gravelly clay; strong fine and medium angular blocky structure; firm; few fine roots; common prominent brownish yellow (10YR 6/6) silt coatings; common distinct (2.5YR 4/4) clay films; 29 percent angular pebbles 0.1 inch to 3 inches across; strongly acid; gradual wavy boundary.

Bt3—20 to 37 inches; red (2.5YR 4/8) gravelly clay; moderate fine and medium angular blocky structure; firm; few fine roots; common prominent brownish yellow (10YR 6/6) silt coatings; many prominent (2.5YR 4/6) clay films on faces of peds and in pores; 19 percent angular pebbles 0.1 inch to 3 inches across; strongly acid; gradual wavy boundary.

Bt4—37 to 55 inches; red (2.5YR 4/6) gravelly clay; strong fine and medium angular blocky structure; very firm; many medium and coarse prominent light yellowish brown (10YR 6/4) silt coatings; many prominent (2.5YR 4/6) clay films on faces of peds; 26 percent angular pebbles 0.1 inch to 3 inches across; few slickensides in the lower part; strongly acid; gradual wavy boundary.

Bt5—55 to 71 inches; red (2.5YR 4/6) gravelly clay; moderate medium angular blocky structure; very firm; many prominent light yellowish brown (10YR 6/4) silt coatings; many prominent (2.5YR 4/6) clay films on faces of peds; 25 percent angular and rounded pebbles 0.1 inch to 3 inches across and 5 percent cobbles 3 to 6 inches across; few slickensides; strongly acid; gradual wavy boundary.

Bt6—71 to 97 inches; dark red (2.5YR 3/6) gravelly clay; moderate coarse columnar structure parting to moderate medium angular blocky; firm; many prominent light yellowish brown (10YR 6/4) silt coatings; many prominent clay films on faces of peds; 20 percent angular and rounded pebbles 0.1 inch to 3 inches across and 3 percent cobbles 3 to 6 inches across; few slickensides; strongly acid.

The thickness of the solum and the depth to limestone bedrock range from 60 to more than 100 inches. The content of angular and rounded pebbles ranges from 5 to 50 percent, by volume, in individual horizons of the solum. By weighted average, the content of rock fragments in the particle-size control section ranges from 15 to 35 percent. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

The Ap horizon typically has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. In severely eroded pedons it has chroma of 3 to 6. The fine-earth fraction is silt loam or silty clay loam.

The BE horizon, if it occurs, has hue of 10YR or 7.5YR and value and chroma of 4 to 6. The fine-earth fraction is silt loam or silty clay loam.

The Bt horizon typically has hue of 5YR, 2.5YR, or 10R, value of 4 or 5, and chroma of 4 to 6. In some pedons the lower part of the horizon has value of 3. The fine-earth fraction is mainly silty clay or clay but ranges to silty clay loam in the upper part.

The BC or C horizon, if it occurs, is similar to the Bt horizon or is mottled in shades of red, brown, and gray. The fine-earth fraction is silty clay or clay.

Caneyville Series

The Caneyville series consists of moderately deep, well drained soils that are moderately slowly permeable. These soils formed in limestone residuum. They are on narrow ridgetops and dissected side slopes throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 6 to 90 percent. The soils are fine, mixed, mesic Typic Hapludalfs.

Caneyville soils are on the same landscape as Corydon, Fredonia, Lenberg, Gilpin, and Rosine soils. Corydon, Fredonia, and Lenberg soils formed in limestone or shale residuum on adjacent side slopes. Corydon soils are shallow to bedrock. They have a darker surface layer than that of the Caneyville soils. Fredonia soils are redder in the control section than the Caneyville soils. Lenberg soils formed in material weathered from acid, clayey shale. Gilpin soils formed in material weathered from sandstone, siltstone, or shale. They commonly are higher on the landscape than the Caneyville soils. Rosine soils formed in a thin mantle of loess and in the underlying clayey shale residuum. They are fine-silty in the control section.

Typical pedon of Caneyville silt loam, in an area of Caneyville-Rock outcrop complex, 12 to 30 percent slopes; in Breckinridge County; about 1 mile west of Fairfield on Kentucky Highway 690, about 150 feet north of the road, and 1,000 feet east of Muddy Branch; in a deciduous forest; soil map sheet 66:

Oe—½ inch to 0; partly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 6 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; neutral; abrupt smooth boundary.

Bt1—6 to 10 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky

structure; firm; common fine roots; common distinct clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—10 to 21 inches; red (2.5YR 4/6) clay; few medium prominent strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; very firm; few fine roots; many distinct clay films on faces of peds; 2 percent angular pebbles 0.1 to 1 inch across; strongly acid; clear smooth boundary.

Bt3—21 to 24 inches; red (2.5YR 5/6) clay; common medium and coarse prominent dark grayish brown (2.5Y 4/2) mottles; moderate fine angular blocky structure; very firm; many distinct clay films on faces of peds; neutral.

R—24 inches; light gray, massive limestone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of rock fragments ranges from 0 to 10 percent throughout the profile. The rock fragments are limestone or sandstone. Reaction ranges from very strongly acid to neutral in the upper part of the solum and from moderately acid to slightly alkaline in the lower part.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 or 3. In severely eroded areas it has hue of 10YR to 5YR, value of 4 or 5, and chroma of 3 to 6. Some pedons have an Ap horizon, which has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. In some pedons the A horizon is underlain by an E horizon, which has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. The texture of the A or Ap horizon is silt loam or silty clay loam in uneroded or eroded areas and silty clay in severely eroded areas.

The Bt horizon has hue of 10YR to 2.5YR, value or 4 or 5, and chroma of 4 to 8. In some pedons the lower part of the horizon has mottles in shades of red, brown, olive, and gray. The texture is silty clay loam, silty clay, or clay.

Chagrin Series

The Chagrin series consists of very deep, well drained soils that are moderately permeable. These soils formed in mixed alluvium. They are on flood plains along the Ohio River. Slopes range from 0 to 2 percent. The soils are fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts.

Chagrin soils are on the same landscape as Yeager, Huntington, Lindside, and Newark soils. Yeager soils have more sand throughout than the Chagrin soils. Huntington soils have a mollic epipedon and have less sand than the Chagrin soils. Lindside and Newark soils are fine-silty in the control section. They are not so well drained as the Chagrin soils.

Typical pedon of Chagrin fine sandy loam, occasionally flooded; in Breckinridge County; about 14 miles north of Hardinsburg on Kentucky Highway 259, about 1 mile south of Ammons on the Ammons-Stephensport Road, 600 feet west of barn, and 200 feet east of the Ohio River; in a cultivated field; soil map sheet 21:

Ap—0 to 9 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; few prominent dark brown (10YR 3/3) organic stains on faces of peds and in root channels; common fine mica flakes; slightly acid; abrupt smooth boundary.

Bw—9 to 37 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; very friable; few prominent dark brown (10YR 3/3) organic stains on faces of peds and in root channels; common wormcasts; common fine mica flakes; slightly acid; clear wavy boundary.

C—37 to 63 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; common fine mica flakes; neutral.

The thickness of the solum ranges from 24 to 48 inches. The depth to bedrock ranges from 60 to more than 100 inches. The content of rock fragments ranges, by volume, from 0 to 14 percent in the Ap horizon, from 0 to 15 percent in the Bw horizon, and from 0 to 25 percent in the C horizon. By weighted average, the content of rock fragments in the particle-size control section ranges from 0 to 15 percent. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The fine-earth fraction is fine sandy loam, sandy loam, loam, or silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The fine-earth fraction is dominantly silt loam or loam with thin strata of sandy loam, fine sandy loam, clay loam, or silty clay loam. In some pedons the faces of peds have thin coatings of organic material.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. The fine-earth fraction is loam, silt loam, sandy loam, or fine sand. In some pedons the horizon is stratified. The texture generally becomes coarser with increasing depth.

Clifty Series

The Clifty series consists of very deep, well drained soils that are moderately rapidly permeable. These soils formed in alluvium derived from acid sandstone,

siltstone, shale, and loess. They are on flood plains in narrow valleys throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 0 to 3 percent. The soils are fine-loamy, mixed, mesic Fluventic Dystrochrepts.

Clifty soils are on the same landscape as Cuba, Steff, and Stendal soils. Cuba, Steff, and Stendal soils have less gravel in the upper part of the solum than the Clifty soils. Steff and Stendal soils are not so well drained as the Clifty soils. They have gray mottles in the subsoil.

Typical pedon of Clifty gravelly silt loam, occasionally flooded; in Breckinridge County; about 0.25 mile west of Frymire on Kentucky Highway 144, about 1 mile south on a gravel road, 500 feet east of the road, and 100 feet north of Sugar Tree Run; in a cultivated field; soil map sheet 23:

Ap—0 to 8 inches; brown (10YR 4/3) gravelly silt loam; weak fine granular structure; very friable; 20 percent pebbles 0.1 inch to 2 inches across; common fine roots; slightly acid; abrupt smooth boundary.

Bw—8 to 34 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; 12 percent pebbles 0.1 inch to 2 inches across; common fine roots; common distinct brown (10YR 5/3) silt coatings on peds; strongly acid; clear wavy boundary.

C—34 to 64 inches; dark yellowish brown (10YR 4/4) very gravelly loam; massive; loose; 60 percent pebbles 0.1 inch to 3 inches across; strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 15 to 35 percent in the surface layer, from 15 to 50 percent in individual horizons of the subsoil, and from 20 to 70 percent in the C horizon. By weighted average, the content of rock fragments in the particle-size control section ranges from 15 to 35 percent. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The fine-earth fraction is silt loam or loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. In some pedons it has mottles with chroma of 2 or less below a depth of 24 inches. The fine-earth fraction is silt loam or loam.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 6. In some pedons it has gray mottles. The fine-earth fraction ranges from silt loam to sandy loam. In some pedons the horizon is stratified.

Corydon Series

The Corydon series consists of shallow, well drained soils that are moderately slowly permeable. These soils formed in limestone residuum. They are mainly on south-facing, moderately steep to steep side slopes on uplands in the central part of the survey area. Slopes range from 12 to 30 percent. The soils are clayey, mixed, mesic Lithic Argiudolls.

Corydon soils are on the same landscape as Caneyville, Fredonia, Rosine, and Gilpin soils. Caneyville and Fredonia soils are on adjacent side slopes. They formed in moderately deep, clayey limestone residuum. They do not have the dark surface layer that is characteristic of the Corydon soils. Rosine soils formed in a thin mantle of loess and in the underlying clayey shale residuum. They are on side slopes, generally above the Corydon soils. Gilpin soils formed in material weathered from sandstone, siltstone, or shale. They are commonly higher on the landscape than the Corydon soils.

Typical pedon of Corydon silt loam, in an area of Rock outcrop-Corydon complex, 12 to 30 percent slopes; in Breckinridge County; about 2 miles northeast of Fairfield on Kentucky Highway 690, about 500 feet west on Duncan Valley Road, and 100 feet north of the road; in a mixed deciduous and evergreen forest; soil map sheet 60:

Oe—½ inch to 0; partly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine granular structure; friable; common medium and coarse roots; 14 percent limestone flagstones 6 to 15 inches long; neutral; clear smooth boundary.

AB—6 to 9 inches; very dark grayish brown (10YR 3/2) silty clay loam; common fine prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common fine pores; common medium and coarse roots; common distinct clay films on faces of peds in the B part; slightly acid; clear smooth boundary.

Bt—9 to 19 inches; yellowish red (5YR 4/6) silty clay; moderate medium angular blocky structure; firm; many medium roots; 2 percent chert fragments 0.1 inch to 3 inches long; many prominent dark reddish gray (5YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

R—19 inches; light gray limestone bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer and from 0 to 30 percent in the subsoil.

The rock fragments consist mainly of flagstones and cobbles of limestone and sandstone. Reaction is slightly acid or neutral throughout the profile.

The A horizon has hue of 10YR or 7.5YR and value and chroma of 2 or 3. The fine-earth fraction is silt loam or silty clay loam.

The Bt horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 3 to 6. The fine-earth fraction is silty clay or clay. The limestone bedrock underlying the Bt horizon is commonly fractured in the upper few inches. Lithic contact is at a depth of less than 20 inches.

Crider Series

The Crider series consists of very deep, well drained soils that are moderately permeable. These soils formed in a thin mantle of loess and in the underlying limestone residuum or old alluvium (fig. 30). They are on broad ridgetops, side slopes, and foot slopes on uplands in the eastern part of Breckinridge County and the central and eastern parts of Meade County. Slopes range from 2 to 20 percent, but most are less than 12 percent. The soils are fine-silty, mixed, mesic Typic Paleudalfs.

Crider soils are on the same landscape as Nicholson, Baxter, Fredonia, and Nolin soils. Nicholson soils have a fragipan and are moderately well drained. Baxter soils are clayey and have 15 to 35 percent, by volume, coarse fragments in the control section. Fredonia soils are clayey and 20 to 40 inches deep over bedrock. Nolin soils formed in adjacent alluvial depressions. They do not have an argillic horizon.

Typical pedon of Crider silt loam, 2 to 6 percent slopes, eroded; in Breckinridge County; about 2 miles west of Bewleyville on Kentucky Highway 333, about 600 feet north of the highway, and 300 feet west of a farmhouse; in a hayfield; soil map sheet 39:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Bt1—7 to 17 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; very friable; common fine roots; common distinct clay films on faces of peds and in pores; slightly acid; clear smooth boundary.

Bt2—17 to 24 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds and in pores; few prominent black stains of iron and manganese oxide on faces of peds; moderately acid; gradual wavy boundary.

Bt3—24 to 31 inches; yellowish red (5YR 4/6) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds and in pores; few prominent black stains of iron and manganese oxide; moderately acid; gradual wavy boundary.

2Bt4—31 to 38 inches; red (2.5YR 4/6) silty clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; strong fine angular blocky structure; firm; many distinct clay films on faces of peds; few prominent black stains of iron and manganese oxide; strongly acid; gradual smooth boundary.

2Bt5—38 to 56 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles; strong fine angular blocky structure; firm; many distinct clay films on faces of peds and in pores; few prominent black stains of iron and manganese oxide; 5 percent angular and subrounded pebbles 0.1 to 0.5 inch across; strongly acid; gradual smooth boundary.

2Bt6—56 to 80 inches; red (2.5YR 4/6) clay; strong fine angular blocky structure; firm; many distinct clay films on faces of peds and in pores; few prominent black stains of iron and manganese oxide; strongly acid.

The thickness of the solum ranges from 60 to 100 inches. The depth to limestone bedrock ranges from 60 to more than 120 inches. The content of rock fragments ranges from 0 to 15 percent, by volume, below the lithologic discontinuity. The rock fragments are mostly angular chert. Reaction ranges from strongly acid to neutral in the A horizon and in the upper part of the B horizon and from very strongly acid to moderately acid in the lower part of the B horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or silty clay loam.

The E horizon, if it occurs, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam.

The upper part of the Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The lower part has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. The Bt horizon is silt loam or silty clay loam.

The 2Bt horizon has hue of 5YR to 10R, value of 3 to 5, and chroma of 4 to 8. It is dominantly silty clay or clay, but the upper part ranges to silty clay loam.

Cuba Series

The Cuba series consists of very deep, well drained soils that are moderately permeable. These soils

formed in mixed acid alluvium derived from sandstone, siltstone, shale, and loess. They are on flood plains in narrow valleys and near the larger streams, mostly in Breckinridge County. Slopes are mostly 0 to 2 percent but range to 3 percent. The soils are fine-silty, mixed, mesic Fluventic Dystrochrepts.

Cuba soils are on the same landscape as Clifty, Steff, Stendal, and Nolin soils. Clifty soils have more rock fragments in the solum than the Cuba soils. They are in a fine-loamy family. Steff soils are moderately well drained. Stendal soils are somewhat poorly drained. Nolin soils are less acid than the Cuba soils.

Typical pedon of Cuba silt loam, occasionally flooded; in Breckinridge County; about 0.5 mile northeast of Falls of Rough, on the McQuady-Glen Dean-Falls of Rough Road, 200 feet south of the road, and 200 feet north of Rough River; in a cultivated field; inset to soil map sheet 2:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; strongly acid; clear smooth boundary.
Bw1—8 to 20 inches; brown (10YR 5/3) silt loam; common fine faint brown mottles; weak very fine subangular blocky structure; very friable; strongly acid; gradual smooth boundary.
Bw2—20 to 30 inches; mottled brown (10YR 5/3), pale brown (10YR 6/3), and dark brown (10YR 3/3) silt loam; weak fine subangular blocky structure; very friable; very strongly acid; gradual smooth boundary.
C—30 to 66 inches; mottled dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) silt loam; weak very fine subangular blocky structure; very friable; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments is less than 15 percent, by volume. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons it has mottles with chroma of 1 or 2 below a depth of 24 inches. The texture is silt loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 1 to 6. In most pedons it is mottled in shades of brown and gray. The texture is silt loam or loam.

Dekalb Series

The Dekalb series consists of moderately deep, well drained soils that are rapidly permeable. These soils formed in material weathered from acid sandstone, siltstone, and shale. They are on side slopes throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 12 to 60 percent. The soils are loamy-skeletal, mixed, mesic Typic Dystrochrepts.

Dekalb soils are on the same landscape as Gilpin, Rosine, Lenberg, and Caneyville soils. Gilpin soils are fine-loamy in the control section. Rosine soils are fine-silty in the control section and are very deep to bedrock. Lenberg and Caneyville soils are clayey in the control section.

Typical pedon of Dekalb loam, in an area of Gilpin-Dekalb-Rock outcrop complex, 30 to 60 percent slopes; in Breckinridge County; about 1.0 mile southwest of High Plains Corner on Kentucky Highway 2199, about 0.75 mile northwest on High Plains Road, 2,700 feet north on Bower-Algood Road, and 500 feet east of the road; in a deciduous forest; soil map sheet 48:

Oi—1 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.
A—0 to 2 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent sandstone pebbles 0.1 inch to 3 inches long; moderately acid; clear smooth boundary.
E—2 to 5 inches; yellowish brown (10YR 6/4) channery loam; moderate medium granular structure; friable; common fine to coarse roots; 15 percent sandstone channers 0.1 inch to 4 inches long; strongly acid; clear smooth boundary.
Bw1—5 to 14 inches; yellowish brown (10YR 5/4) channery sandy loam; weak medium subangular blocky structure; friable; common fine to coarse roots; 35 percent sandstone channers and pebbles 0.1 inch to 4 inches long; very strongly acid; clear wavy boundary.
Bw2—14 to 28 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 45 percent sandstone channers and pebbles 0.1 inch to 4 inches long; very strongly acid; clear wavy boundary.
C—28 to 38 inches; brownish yellow (10YR 6/6) extremely channery sandy loam; massive; friable;

65 percent sandstone channers and pebbles 0.1 inch to 6 inches long; very strongly acid.
R—38 inches; yellowish brown sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer, from 10 to 50 percent in the individual horizons of the subsoil, and from 50 to 90 percent in the C horizon. The rock fragments are sandstone. By weighted average, the content of rock fragments in the particle-size control section ranges from 35 to 75 percent. In unlimed areas reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 3, and chroma of 1 or 2. The fine-earth fraction is silt loam or loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. The fine-earth fraction is silt loam or loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The fine-earth fraction is sandy loam, fine sandy loam, or loam.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. The fine-earth fraction is sandy loam or loamy sand.

Elk Series

The Elk series consists of very deep, well drained soils that are moderately permeable. These soils formed in mixed alluvium derived from limestone, sandstone, siltstone, shale, and loess. They are on stream terraces along the Ohio River and its tributaries in the northern part of the survey area. Slopes range from 0 to 40 percent. The soils are fine-silty, mixed, mesic Ultic Hapludalfs.

Elk soils are on the same landscape as Wheeling, Sciotoville, and Weinbach soils. Wheeling soils are fine-loamy in the control section. Sciotoville and Weinbach soils have a fragipan. Sciotoville soils are moderately well drained. Weinbach soils are somewhat poorly drained.

Typical pedon of Elk silt loam, 2 to 6 percent slopes; in Breckinridge County; about 1.5 miles south of Addison on Kentucky Highway 144, about 1,300 feet east of the highway, and 100 feet south of a field border; in a cultivated field; inset to soil map sheet 14:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.
BA—8 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—16 to 37 inches; dark brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.
Bt2—37 to 51 inches; dark brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.
2C—51 to 76 inches; mottled yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) sandy loam; massive; loose; strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock ranges from 60 to more than 100 inches. Reaction ranges from very strongly acid to slightly acid in the solum and from strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam. In most pedons a BA or BE horizon is above the Bt horizon. It has colors and textures similar to those of the Bt horizon.

The 2C horizon has the same colors as the Bt horizon. It is sandy loam or loam. In some pedons it is stratified.

Fredonia Series

The Fredonia series consists of moderately deep, well drained soils that are moderately slowly or slowly permeable. These soils formed in red and reddish brown, clayey limestone residuum. They are mainly on karst ridgetops and side slopes on uplands throughout the central and eastern parts of the survey area. Discontinuous rock outcrops occur in areas of the soils. Slopes range from 6 to 20 percent. The soils are fine, mixed, mesic Typic Hapludalfs.

The Fredonia soils in this survey area have a yellower hue in the substratum than is allowed for the series. This difference, however, does not alter use and management of the soils.

Fredonia soils are on the same landscape as Crider and Baxter soils. Crider and Baxter soils have a solum that is more than 60 inches thick. Crider soils have less than 35 percent clay in the control section. Baxter soils have 15 to 35 percent, by volume, chert fragments in the control section.

Typical pedon of Fredonia silt loam, in an area of Fredonia-Crider complex, karst, rocky, 12 to

20 percent slopes, eroded; in Breckinridge County; about 1 mile southeast of Irvington on Kentucky Highway 2202, about 600 feet east of the highway, and 400 feet north of an old farm road; in a mixed deciduous and evergreen forest; soil map sheet 39:

Oi—1/2 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.
A—0 to 4 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium granular and weak fine subangular blocky structure; friable; few fine and medium roots; slightly acid; abrupt smooth boundary.
Bt1—4 to 9 inches; yellowish red (5YR 4/6) silty clay; moderate coarse subangular blocky structure parting to moderate fine and medium subangular blocky; firm; many distinct dark brown (7.5YR 4/4) silt coatings on faces of peds; common fine and few medium roots; few fine pores; strongly acid; clear smooth boundary.
Bt2—9 to 26 inches; red (2.5YR 4/6) silty clay; many fine prominent yellow (10YR 7/6) mottles below a depth of 19 inches; moderate coarse subangular blocky structure parting to moderate medium angular and subangular blocky; firm; few fine and coarse roots; many prominent clay films on faces of peds; moderately acid; clear smooth boundary.
C—26 to 30 inches; red (2.5YR 4/6) silty clay; many medium distinct light brown (7.5YR 6/4) and common fine prominent yellow (10YR 7/8) mottles; massive; very firm; few fine roots; neutral; abrupt smooth boundary.
R—30 inches; gray, massive, fractured limestone bedrock.

The thickness of the solum and the depth to limestone bedrock range from 20 to 40 inches. In unlimed areas reaction ranges from strongly acid to slightly acid in the A horizon and in the upper part of the B horizon and from strongly acid to neutral in the lower part of the B horizon and in the C horizon.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma or 2 to 4. It is silt loam or silty clay loam. Some pedons have an Ap horizon, which has colors and textures similar to those of the A horizon.

The Bt horizon has hue of 5YR to 10R, value of 3 or 4, and chroma of 4 to 6. It is dominantly silty clay or clay, but in some pedons the upper part is silty clay loam.

The BC or C horizon has hue of 5YR, 2.5YR, or 10R, value of 3 or 4, and chroma of 4 to 6, or it is mottled in shades of brown, yellow, olive, or gray. It is silty clay or clay.

Gatton Series

The Gatton series consists of very deep, moderately well drained soils that have a fragipan. Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in a thin mantle of loess and in the underlying material weathered from unconsolidated sandstone. They are on narrow ridgetops in the Sand Ridge area in the southeastern part of Meade County. Slopes range from 2 to 6 percent. The soils are fine-loamy, mixed, mesic Typic Fragiudalfs.

Gatton soils are on the same landscape as Sadler, Zanesville, and Riney soils. Sadler and Zanesville soils are fine-silty in the control section. Riney soils do not have a fragipan.

Typical pedon of Gatton silt loam, 2 to 6 percent slopes, eroded; in Meade County; about 2 miles east of Flaherty, on Kentucky Highway 1816, and about 600 feet south of the highway; in a brushy field on the edge of a small quarry; soil map sheet 42:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.
Bt1—6 to 12 inches; strong brown (7.5YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; common distinct clay films on faces of peds; many fine roots; strongly acid; clear smooth boundary.
Bt2—12 to 20 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct brown (7.5YR 5/4) mottles; moderate medium angular and subangular blocky structure; firm; common distinct clay films on faces of peds and in pores; common fine and medium dark brown concretions; common fine roots; strongly acid; abrupt wavy boundary.
2Btx—20 to 34 inches; yellowish brown (10YR 5/4) loam; common fine distinct strong brown (7.5YR 5/6) and common fine faint pale brown mottles; thin skeletans of pale brown (10YR 6/3) fine sand between prisms, white (10YR 8/1) dry; moderate very coarse prismatic structure parting to moderate medium and coarse angular and subangular blocky; very firm; brittle and compact in about 70 percent of the horizon; many prominent dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; few fine black concretions; strongly acid; clear wavy boundary.
3Bt3—34 to 46 inches; mottled red (2.5YR 4/6) and strong brown (7.5YR 5/8) sandy clay; strong fine and medium angular blocky structure; firm; many prominent clay films on faces of peds; 5 percent

sandstone fragments 0.1 to 1 inch long; strongly acid; gradual wavy boundary.

3Bt4—46 to 72 inches; red (2.5YR 4/6) sandy clay; many medium and coarse prominent strong brown (7.5YR 5/8) mottles; strong fine and medium angular blocky structure; firm; many prominent clay films on faces of peds; 5 percent sandstone fragments 0.1 to 1 inch; strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Depth to the fragipan ranges from 20 to 30 inches. The content of coarse fragments ranges from 0 to 5 percent, by volume, in the lower part of the solum. In unlimed areas reaction is strongly acid or very strongly acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

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

The 2Btx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6. It is mottled in shades of brown, yellow, red, or gray. It is fine sandy loam or loam.

The 3Bt horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 4 to 8. It is mottled in shades of red, brown, yellow, or gray. It is clay, sandy clay, or clay loam.

Gilpin Series

The Gilpin series consists of moderately deep, well drained soils that are moderately permeable. These soils formed in material weathered from acid sandstone, siltstone, and shale. They are on side slopes and narrow ridgetops throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 6 to 60 percent. The soils are fine-loamy, mixed, mesic Typic Hapludults.

Gilpin soils are on the same landscape as Zanesville, Dekalb, Rosine, Lenberg, and Caneyville soils. Zanesville soils are deep to bedrock and have a fragipan. Dekalb soils have more than 35 percent, by volume, rock fragments in the control section. Rosine soils are very deep and have more clay in the lower part of the subsoil than the Gilpin soils. Lenberg and Caneyville soils have more clay in the subsoil than the Gilpin soils. Rosine and Lenberg soils are underlain by soft shale. Caneyville soils are underlain by limestone.

Typical pedon of Gilpin loam, in an area of Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, eroded; in Breckinridge County; 4 miles south of Hardinsburg on Kentucky Highway 261, about 1.5 miles southeast on Kirk-Axtel Road, 700 feet east of the road, 50 feet north of a field border, and 200 feet south of a tributary of Tules Creek; in a deciduous forest; soil map sheet 58:

Oe—1/2 inch to 0; partly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 4 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; very friable; many fine and medium roots; 10 percent sandstone channers 0.1 inch to 3 inches long; strongly acid; clear wavy boundary.

BE—4 to 10 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; many fine and medium roots; 5 percent sandstone channers 0.1 inch to 3 inches long; very strongly acid; clear smooth boundary.

Bt1—10 to 18 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; common fine and medium roots; few distinct clay films on faces of peds; 5 percent sandstone channers 0.1 inch to 3 inches long; very strongly acid; clear smooth boundary.

Bt2—18 to 24 inches; dark brown (7.5YR 4/4) channery loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; 30 percent sandstone channers 0.1 inch to 5 inches long; very strongly acid; clear smooth boundary.

Bt3—24 to 29 inches; strong brown (7.5YR 5/6) very channery loam; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds and on fragments; 55 percent sandstone channers 0.1 inch to 5 inches long; very strongly acid; clear wavy boundary.

R—29 inches; fractured, yellowish brown sandstone bedrock.

The thickness of the solum ranges from 18 to 36 inches. The depth to sandstone bedrock ranges from 20 to 40 inches. The content of rock fragments, which are siltstone and sandstone, ranges from 0 to 14 percent in the surface layer, from 5 to 55 percent in individual horizons of the subsoil, and from 30 to 90 percent in the C horizon. By weighted average, the content of rock fragments in the particle-size control section is less than 35 percent. In unlimed areas reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Some pedons have an Ap horizon, which has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The A horizon is underlain by a BE horizon that has hue of 10YR, value of 5, and chroma of 3 or 4. The A and BE horizons are loam or silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth fraction is silt loam, loam, or silty clay loam.

The C horizon, if it occurs, has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 8. The fine-earth fraction is loam, silt loam, or silty clay loam.

Hammack Series

The Hammack series consists of very deep, well drained soils that are moderately permeable. These soils formed in a thin mantle of loess and in the underlying cherty limestone residuum. They are on karst ridgetops and side slopes on uplands in the eastern part of Breckinridge County and in the central and eastern parts of Meade County. Slopes range from 2 to 12 percent. The soils are fine-silty, mixed, mesic Glossic Paleudalfs.

Hammack soils are on the same landscape as Baxter, Nicholson, Crider, Fredonia, and Nolin soils. Baxter soils are clayey. The content of rock fragments in their control section ranges from 15 to 35 percent, by volume. Nicholson and Crider soils are fine-silty in the control section. Also, Nicholson soils have a fragipan and are moderately well drained. Fredonia soils are 20 to 40 inches deep over bedrock. Nolin soils formed in alluvial depressions. They do not have an argillic horizon.

Typical pedon of Hammack silt loam, 2 to 6 percent slopes, eroded; in Meade County; about 1 mile west of Ekron on Kentucky Highway 144, about 1 mile north on the Hardesty-Molly Brown Road, and 800 feet east of the road; in a hayfield; soil map sheet 25:

Ap—0 to 4 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; very friable; many fine roots; 4 percent angular pebbles 0.1 to 1 inch long; slightly acid; abrupt smooth boundary.

AB—4 to 9 inches; silt loam that is 65 percent dark yellowish brown (10YR 4/4) A peds and 35 percent strong brown (7.5YR 5/6) B peds; moderate fine and medium granular structure (A peds) and moderate medium subangular blocky structure (B peds); friable; common fine roots; moderately acid; clear wavy boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium and coarse subangular blocky structure; friable; common distinct brown (7.5YR 4/4) silt flows in voids; few distinct clay films on faces of peds; common fine roots; 4 percent angular pebbles 0.1 to 1 inch long; moderately acid; clear wavy boundary.

B/E—17 to 27 inches; mottled strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few fine roots; common prominent black stains of iron and manganese oxide; about 12 percent common distinct light gray (10YR 7/2) silt coatings, 10 to 20 millimeters thick, between peds and fragments; 4 percent angular pebbles 0.1 to 1 inch long; strongly acid; clear wavy boundary.

2Bt/E—27 to 40 inches; mottled red (2.5YR 4/6) and yellowish red (5YR 5/6) extremely gravelly silty clay loam; moderate fine and medium angular and subangular blocky structure; firm; 10 percent common prominent light gray (10YR 7/2) pockets and coatings surrounding fragments; common distinct clay films on faces of peds; few prominent black stains of iron and manganese oxide; 56 percent angular pebbles 0.1 inch to 3 inches across and 16 percent angular cobbles 3 to 10 inches across; very strongly acid; gradual wavy boundary.

2Bt2—40 to 53 inches; dark red (2.5YR 3/6) clay; common medium distinct yellowish red (5YR 5/6) mottles; strong fine and medium angular blocky structure; very firm; many prominent clay films on faces of peds; 10 percent angular pebbles 0.1 inch to 3 inches long; strongly acid; gradual wavy boundary.

2Bt3—53 to 73 inches; dark red (2.5YR 3/6) clay; common coarse distinct yellowish red (5YR 5/6) mottles; strong medium and coarse angular blocky structure parting to moderate fine and medium angular blocky; very firm; many prominent clay films on faces of peds; few distinct (5 percent) slickensides 3 to 5 inches across in the lower part of the horizon; few prominent black stains of iron and manganese oxide on faces of peds; 2 percent angular pebbles 0.1 to 1 inch long; strongly acid; gradual wavy boundary.

2Bt4—73 to 86 inches; dark red (2.5YR 3/6) clay; common coarse distinct yellowish red (5YR 5/6) mottles; strong medium and coarse angular blocky structure; very firm; many prominent clay films on peds; few distinct (10 percent) slickensides 3 to 5 inches across; few prominent black stains of iron and manganese oxide on faces of peds; 2 percent angular pebbles 0.1 to 1 inch long; strongly acid.

The thickness of the solum and the depth to limestone bedrock range from 60 to more than 120 inches. The upper part of the solum formed in loess. It is about 20 to 40 inches thick. The content of rock fragments ranges, by volume, from 0 to 5 percent in the A and Bt horizons, from 35 to 80 percent in the 2Bt/E horizon, and from 0 to 50 percent in individual 2Bt horizons. By weighted average, the content of rock fragments in the particle-size control section is

15 to 50 percent. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The Bt1 horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. It is silt loam or silty clay loam.

The B part of the B/E horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 5 or 6. The E part of the B/E horizon has hue of 10YR, value of 6 or 7, and chroma of 1 to 4. It consists of silt coatings that make up 5 to 15 percent of the horizon. The fine-earth fraction of the B/E horizon is silt loam or silty clay loam.

The 2Bt part of the 2Bt/E horizon has hue of 10YR to 2.5YR, value of 4 or 5, and chroma of 4 to 6. In some pedons it is mottled in shades of brown and gray. The fine-earth fraction is silt loam or silty clay loam. The E part consists of silt coatings that make up 5 to 15 percent of the horizon. It has hue of 10YR or 7.5YR, value of 6 or 7, and chroma of 1 to 4.

The 2Bt horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 4 to 6. It has mottles in shades of yellow, brown, or red. The fine-earth fraction is silty clay loam, silty clay, or clay.

Hosmer Series

The Hosmer series consists of very deep, well drained and moderately well drained soils. Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in more than 4 feet of loess. They are on upland ridgetops and side slopes near the Ohio River valley. Slopes range from 2 to 12 percent. The soils are fine-silty, mixed, mesic Typic Fragiudalfs.

Hosmer soils are on the same landscape as Alford and Zanesville soils. Alford soils are on adjacent ridgetops. They do not have a fragipan. Zanesville soils formed in a thin layer of loess and in material weathered from sandstone, siltstone, and shale.

Typical pedon of Hosmer silt loam, 2 to 6 percent slopes, eroded; in Breckinridge County; about 14 miles north of Hardinsburg on Kentucky Highway 259, about 0.5 mile north of Ammons on a gravel road, and 50 feet east of a barn; in a cultivated field; soil map sheet 14:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; neutral; abrupt smooth boundary.

Bt1—9 to 16 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few distinct dark brown (7.5YR 4/4) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—16 to 25 inches; strong brown (7.5YR 5/6) silty clay loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common distinct dark brown (7.5YR 4/4) clay films; moderately acid; clear smooth boundary.

Btx1—25 to 40 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 50 percent of the horizon; common distinct clay films on faces of peds; common prominent black stains of iron and manganese oxide; very strongly acid; clear wavy boundary.

Btx2—40 to 61 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct gray (10YR 7/1) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 60 percent of the horizon; few prominent dark brown (7.5YR 4/4) clay films on faces of peds; very strongly acid; clear wavy boundary.

2C—61 to 70 inches; yellowish brown (10YR 5/4) silt loam; common medium faint pale brown mottles; massive; friable; 15 percent increase in sand content; very strongly acid.

The thickness of the solum ranges from 50 to 70 inches. The depth to bedrock ranges from 75 to 90 inches. Thickness of the loess ranges from 48 to 70 inches. Depth to the fragipan ranges from 24 to 32 inches. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout the profile.

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

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In some pedons the lower part of the Bt2 horizon has light gray mottles. The horizon is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It has common mottles in shades of gray and brown. It is silt loam or silty clay loam.

The 2C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It has mottles in shades of gray, brown, or red. It is silt loam, loam, or clay loam.

Huntington Series

The Huntington series consists of very deep, well drained soils that are moderately permeable. These soils formed in mixed alluvium on flood plains along the Ohio River. Slopes are mostly 0 to 2 percent but range up to 4 percent. The soils are fine-silty, mixed, mesic Fluventic Hapludolls.

Huntington soils are on the same landscape as Lindside, Newark, and Chagrin soils. Lindside soils are moderately well drained. Newark soils are somewhat poorly drained. Lindside and Newark soils do not have a mollic epipedon. Chagrin soils are fine-loamy in the control section.

Typical pedon of Huntington silt loam, occasionally flooded; in Breckinridge County; about 16 miles north of Hardinsburg on Kentucky Highway 259, about 0.25 mile west of the highway, 1,000 feet south of a farmhouse, and 300 feet east of the Ohio River; in a cultivated field; soil map sheet 14:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; common fine roots; common fine mica flakes; neutral; abrupt smooth boundary.

A—8 to 15 inches; dark brown (10YR 3/3) silt loam; moderate medium granular structure; friable; few fine roots; many distinct very dark grayish brown (10YR 3/2) silt coatings on faces of peds; common fine mica flakes; many wormcasts; neutral; clear smooth boundary.

Bw—15 to 46 inches; brown (10YR 4/3) silt loam; weak medium and coarse subangular blocky structure; firm; few fine roots in the upper part of the horizon; many distinct dark brown (10YR 3/3) silt coatings on faces of peds; many wormcasts; common fine mica flakes; neutral; clear smooth boundary.

C—46 to 70 inches; brown (10YR 4/3) silt loam; common medium faint yellowish brown (10YR 5/4) mottles; massive; common fine mica flakes; neutral.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 120 inches. The thickness of the mollic epipedon ranges from 10 to 24 inches. These soils commonly have no rock fragments. The content of rock fragments ranges from 0 to 3 percent in the solum and from 0 to 20 percent in the C horizon. Reaction ranges from moderately acid to slightly alkaline throughout the profile.

The Ap and A horizons have hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3.

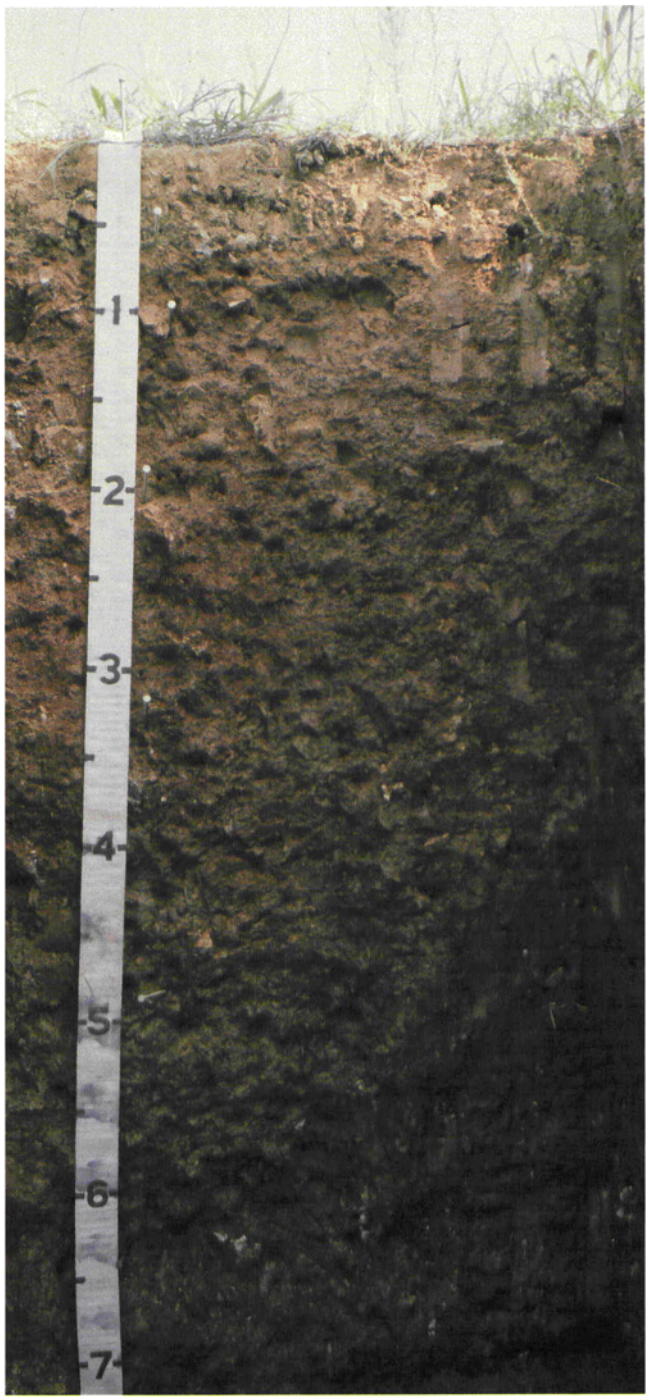

Figure 29.—Typical pedon of Baxter very gravelly silt loam. Baxter soils are clayey and are less than 35 percent, by volume, rock fragments. Depth is marked in feet.

Figure 30.—A profile of Crider silt loam. The Crider series has been chosen as the State Soil of Kentucky. Depth is marked in feet.

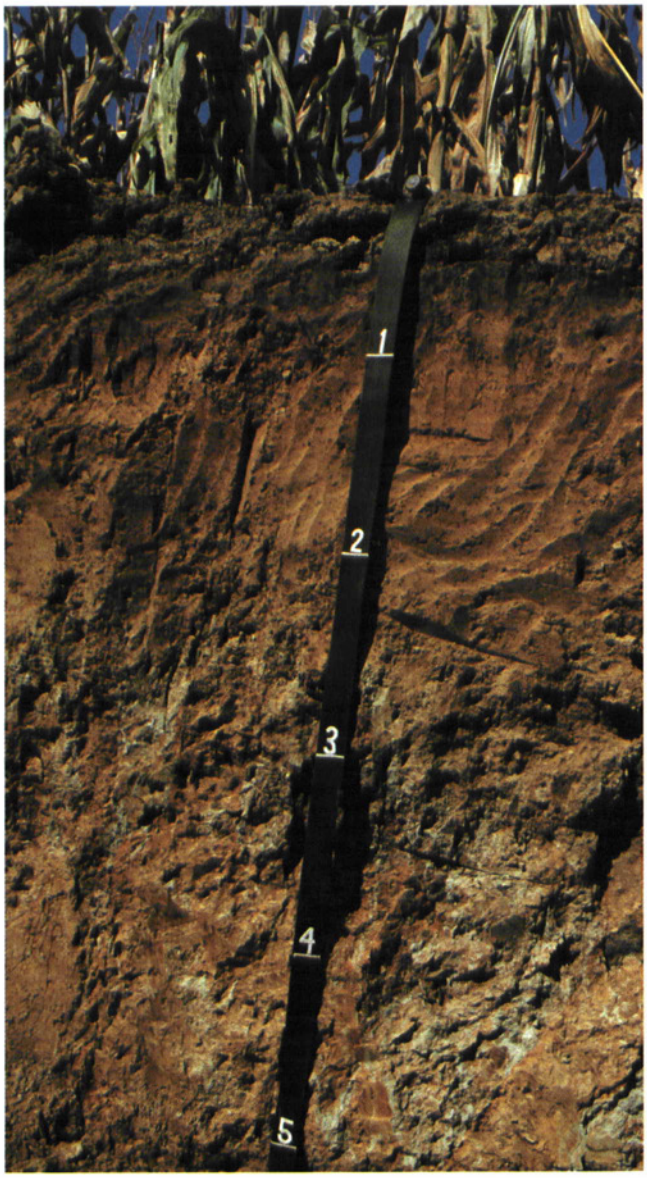

Figure 31.—Typical pedon of Sadler silt loam. Sadler soils are silty throughout. They have a fragipan in the lower part of the profile. Depth is marked in feet.

Figure 32.—A cross-section of the fragipan in the Sadler soils showing the dense interior of the prism, which is about 12 inches wide. Narrow, gray, vertical cracks separate prisms. Prisms are impenetrable to the downward movement of roots and water.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is silt loam or silty clay loam.

The C horizon has colors similar to those of the Bw horizon. The fine-earth fraction is silty clay loam, silt loam, loam, or sandy loam.

Lakin Series

The Lakin series consists of very deep, excessively drained soils that are rapidly permeable. These soils formed in coarse textured eolian or water-laid material. They are on stream terraces along the Ohio River in Meade County. Slopes range from 2 to 15 percent. The soils are mixed, mesic Alfic Udipsamments.

Lakin soils are on the same landscape as Elk, Wheeling, Sciotoville, Weinbach, Huntington, Chargin and Lindside soils. Elk, Wheeling, Sciotoville, and Weinbach soils are on adjacent stream terraces. Huntington, Chagrin, and Lindside soils are on flood plains. Wheeling and Elk soils have an argillic horizon. They have less sand in the control section than the Lakin soils. Sciotoville and Weinbach soils have a fragipan. Huntington soils have a thick, dark surface layer. Chagrin soils are fine-loamy in the control section. Lindside soils have gray mottles below a depth of 15 inches.

Typical pedon of Lakin loamy fine sand, 6 to 15 percent slopes; in Meade County; about 3 miles west of Wolf Creek on Little Bend-Roberta Road, 200 feet southeast of the road, and 2,600 feet northeast of the Ohio River, in Willets Bottom; in a cultivated field; soil map sheet 3:

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) loamy fine sand; very weak fine granular structure; very friable; many fine roots; neutral; abrupt smooth boundary.

E—6 to 11 inches; yellowish brown (10YR 5/4) loamy sand; common fine faint yellowish brown mottles; single grained; very friable; many fine roots; slightly acid; clear smooth boundary.

E and Bt1—11 to 24 inches; yellowish brown (10YR 5/6) loamy sand that has dark brown (7.5YR 4/4) lamellae (horizontal bands) 2 to 10 millimeters thick; single grained in the E part and very weak fine granular structure in the Bt1 part; very friable; common fine roots; moderately acid; clear smooth boundary.

E and Bt2—24 to 45 inches; mottled yellowish brown (10YR 5/6 and 5/4) loamy sand that has dark brown (7.5YR 4/4) lamellae (horizontal bands) 5 to 15 millimeters thick; single grained in the E part and very weak fine granular structure in the

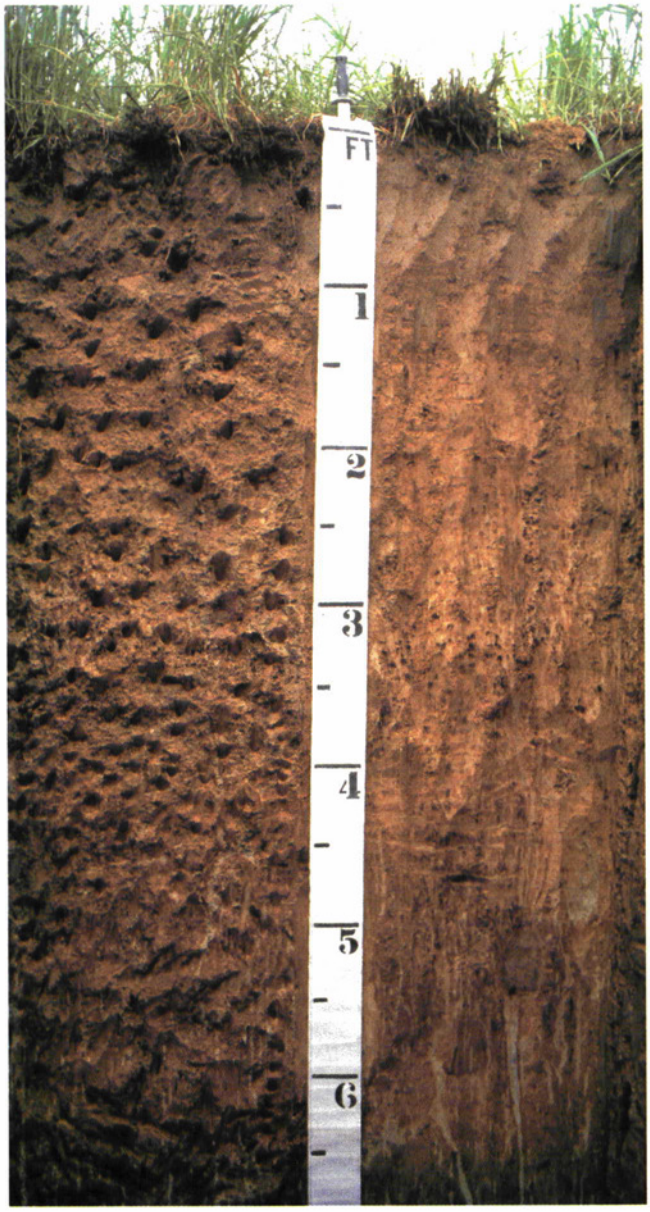

Figure 33.—A profile of Sciotoville silt loam. Sciotoville soils are suited to most cultivated crops grown in the survey area; however, the growth of deep-rooted plants may be limited by the fragipan. Depth is marked in feet.

Bt2 part; very friable; few fine roots; moderately acid; clear wavy boundary.

E and Bt3—45 to 65 inches; mottled yellowish brown (10YR 5/6 and 5/4) loamy sand that has dark brown (7.5YR 4/4) lamellae 10 to 45 millimeters thick; single grained in the E part and very weak fine granular structure in the Bt3 part; very friable; few fine roots; moderately acid.

The thickness of the solum ranges from 40 to more than 80 inches. The depth to bedrock is more than 120 inches. Depth to the uppermost lamella is 10 to 26 inches. Total thickness of the lamellae in the particle-size control section is 5½ inches or less. The content of rock fragments ranges from 0 to 3 percent in the particle-size control section. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

The E horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is loamy fine sand, loamy sand, fine sand, or sand.

The E part of the E and Bt horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. It is loamy fine sand, loamy sand, fine sand, or sand. The Bt part (lamellae or lumps) of the E and Bt horizon has hue of 10YR, 7.5YR, or 5YR and value and chroma of 3 to 6. It typically is loamy fine sand, loamy sand, fine sand, or sand, but the range includes sandy loam and fine sandy loam. The lamellae in the E and Bt horizons are commonly discontinuous horizontal bands or lumps that are ¼ inch to 1½ inches thick.

Lenberg Series

The Lenberg series consists of moderately deep, well drained soils that are moderately slowly permeable. These soils formed in material weathered from acid, clayey shale and material weathered from interbedded siltstone and sandstone. They are on side slopes throughout the survey area. Slopes range from 12 to 30 percent. The soils are fine, mixed, mesic Ultic Hapludalfs.

Lenberg soils are on the same landscape as Gilpin, Dekalb, Caneyville, and Rosine soils. Gilpin and Dekalb soils are in a loamy family. Caneyville soils formed in clayey limestone residuum. Rosine soils are in a fine-silty family. They are more than 40 inches deep over bedrock.

Typical pedon of Lenberg silt loam, in an area of Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, eroded; in Breckinridge County; about 3 miles east of Cloverport on U.S. Highway 60, about 0.8 mile north on Kentucky Highway 144, about 2,000 feet north on Persimmon Flats Road, and 300 feet east of the road; in a deciduous forest; soil map sheet 36:

Oi—1 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium granular structure; friable; common fine and medium roots; slightly acid; clear smooth boundary.

Bt1—3 to 8 inches; yellowish brown (10YR 5/4) silty clay; many medium distinct reddish yellow (7.5YR 6/8) mottles; moderate fine and medium subangular blocky structure; firm; common fine to coarse roots; many distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—8 to 15 inches; light yellowish brown (10YR 6/4) silty clay; common medium faint pale brown and many medium distinct strong brown (7.5YR 5/8) mottles; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; many distinct clay films on faces of peds; 5 percent shale fragments 0.1 to 1 inch across; very strongly acid; clear smooth boundary.

Bt3—15 to 31 inches; mottled strong brown (7.5YR 5/8) and gray (10YR 6/1) silty clay; strong fine and medium angular blocky structure; firm; few very fine roots; many distinct clay films on faces of peds; 10 percent shale fragments 0.1 to 1 inch across; very strongly acid; clear smooth boundary.

Cr—31 to 40 inches; gray (10YR 6/1) and brownish yellow (10YR 6/6), soft interbedded shale and siltstone; very strongly acid.

The thickness of the solum and the depth to paralithic contact range from 20 to 40 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer, from 0 to 30 percent in the subsoil, and from 5 to 60 percent in the C horizon. The rock fragments are shale, siltstone, or sandstone. Reaction ranges from very strongly acid to neutral in the surface layer and in the upper part of the solum. It is very strongly acid or strongly acid in the lower part of the solum and in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Some pedons have an Ap horizon, which has hue of 10YR, value of 4 or 5, and chroma of 2 to 6. The A horizon is silt loam or silty clay.

The E horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or silty clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 8. It typically has mottles in shades of brown, red, yellow, or gray. In some pedons the lower part of the Bt horizon has mottles in shades

of red, brown, yellow, olive, and gray. The low-chroma colors are considered to be inherited from the parent material. The fine-earth fraction is silty clay or clay.

The C horizon, if it occurs, has hue of 2.5Y to 5YR, value of 4 to 7, and chroma of 3 to 8. It has mottles in shades of red, brown, yellow, olive, or gray. The fine-earth fraction is silty clay or clay.

The Cr horizon has hue of 5Y to 5YR, value of 4 to 7, and chroma of 3 to 8. The bedrock is soft, acid, clayey shale interbedded with thin strata of siltstone or sandstone. In some pedons the shale is interbedded with weathered soil material that has colors similar to those of the C horizon.

Lily Series

The Lily series consists of moderately deep, well drained soils that are moderately rapidly permeable. These soils formed in material weathered from acid sandstone, siltstone, and shale. They are on side slopes of the Sand Ridge area in the southeastern part of Meade County. Slopes range from 12 to 30 percent. The soils are fine-loamy, siliceous, mesic Typic Hapludults.

Lily soils are on the same landscape as Riney soils. Riney soils are very deep to bedrock. They are underlain by unconsolidated sandstone.

Typical pedon of Lily loam, in an area of Riney-Lily complex, 20 to 30 percent slopes; in Meade County; about 1 mile south of Flaherty on Kentucky Highway 1600, about 1 mile southwest on Sand Ridge Road, and 800 feet north of the road; in a deciduous forest; soil map sheet 49:

Oi—1 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.

E—3 to 8 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; very friable; common fine to coarse roots; 6 percent sandstone pebbles 0.1 inch to 3 inches wide; very strongly acid; clear wavy boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; friable; common medium roots; few distinct clay films on faces of peds; 15 percent sandstone fragments 0.1 inch to 3 inches long; very strongly acid; clear wavy boundary.

Bt2—15 to 24 inches; strong brown (7.5YR 5/6) gravelly clay loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; 25 percent sandstone fragments 0.1 inch to 3 inches long; very strongly acid; clear wavy boundary.

R—24 inches; fractured sandstone bedrock.

The thickness of the solum and the depth to sandstone bedrock range from 20 to 40 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer and from 0 to 30 percent in the subsoil. The rock fragments are siltstone or sandstone. In unlimed areas reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. Some pedons have an Ap horizon, which has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The E horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is loam or silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth fraction is loam, sandy loam, sandy clay loam, or clay loam.

Lindside Series

The Lindside series consists of very deep, moderately well drained soils that are moderately permeable. These soils formed in mixed alluvium derived from limestone, sandstone, siltstone, shale, and loess. They are on flood plains and in alluvial depressions on uplands throughout the survey area. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, mesic Fluvaquentic Eutrochrepts.

Lindside soils are on the same landscape as Nolin, Newark, Melvin, Elk, and Sciotoville soils. Nolin, Newark, and Melvin soils are on flood plains. Elk and Sciotoville soils are on adjacent stream terraces. Nolin soils are well drained, Newark soils are somewhat poorly drained, and Melvin soils are poorly drained. Elk and Sciotoville soils have an argillic horizon. Also, Sciotoville soils have a fragipan.

Typical pedon of Lindside silt loam, depressional, frequently flooded; in Breckinridge County; about 1 mile north of Bewleyville on Irvington-Bewleyville Road and 800 feet north of the road; in a cultivated field; soil map sheet 39:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; neutral; abrupt smooth boundary.

Bw1—8 to 16 inches; yellowish brown (10YR 5/4) silt loam; weak coarse subangular blocky structure; very friable; common fine roots; slightly acid; clear smooth boundary.

Bw2—16 to 29 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown

(10YR 5/2) and few fine prominent yellowish red (5YR 4/6) mottles; friable; few fine roots; slightly acid; clear smooth boundary.

Bw3—29 to 49 inches; brown (7.5YR 5/4) silt loam; common fine and medium distinct grayish brown (10YR 5/2) and yellowish red (5YR 4/6) mottles; moderate coarse subangular blocky structure; firm; slightly acid; clear smooth boundary.

C—49 to 65 inches; brown (7.5YR 4/4) silty clay loam; massive; firm; few fine angular chert fragments; few prominent black stains of iron and manganese oxide; moderately acid.

The thickness of the solum ranges from 25 to 50 inches. The depth to bedrock ranges from 60 to more than 80 inches. The content of rock fragments ranges from 0 to 5 percent. The rock fragments are mostly rounded pebbles. Reaction ranges from moderately acid to neutral throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is mottled in shades of brown and gray. The depth to mottles with chroma of 2 or less ranges from 15 to 24 inches. The horizon dominantly is silt loam or silty clay loam. In some pedons it has thin strata of fine sandy loam or loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4. It is mottled in shades of brown and gray. It is silt loam, silty clay loam, loam, or fine sandy loam. It is weakly stratified.

Markland Series

The Markland series consists of very deep, well drained soils that are slowly permeable. These soils formed in calcareous, stratified, clayey lacustrine material. They are on terraces along the Ohio River and its major tributaries in the northern part of the survey area. Slopes range from 6 to 35 percent. The soils are fine, mixed, mesic Typic Hapludalfs.

Markland soils are on the same landscape as McGary, Wheeling, Sciotoville, and Weinbach soils. McGary soils are somewhat poorly drained. Wheeling soils are well drained. They are in a fine-loamy family. Sciotoville and Weinbach soils are in a fine-silty family. They have a fragipan. Sciotoville soils are moderately well drained. Weinbach soils are somewhat poorly drained.

Typical pedon of Markland silty clay loam, 12 to 35 percent slopes, severely eroded; in Breckinridge County; about 4 miles south of Cloverport on Cloverport-Balltown Road, 100 feet west of the road, 500 feet east of Tar Fork, and 100 feet east of an old barn; in a deciduous forest; soil map sheet 43:

Oi—2 inches to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 2 inches; dark brown (10YR 3/3) silty clay loam; strong fine granular and subangular blocky structure; friable; many fine and medium roots; neutral; clear smooth boundary.

Bt1—2 to 5 inches; dark yellowish brown (10YR 4/4) silty clay; moderate fine and medium subangular blocky structure; firm; many fine and medium roots; common distinct clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—5 to 22 inches; yellowish brown (10YR 5/4) silty clay; strong fine and medium subangular and angular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; neutral; clear smooth boundary.

Bt3—22 to 36 inches; brown (10YR 4/3) silty clay; common coarse distinct yellowish brown (10YR 5/6) and common medium distinct pale brown (10YR 6/3) mottles; common medium distinct grayish brown (10YR 5/2) mottles below a depth of 30 inches; strong fine and medium subangular and angular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; few coarse secondary lime concretions; slightly alkaline; gradual smooth boundary.

Ck1—36 to 48 inches; mottled dark yellowish brown (10YR 4/4), grayish brown (10YR 5/2), and yellowish brown (10YR 5/6) silty clay; massive; firm; many soft coarse secondary lime masses; strong effervescence; moderately alkaline; gradual smooth boundary.

Ck2—48 to 67 inches; brown (10YR 5/3) silty clay; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; massive; firm; many soft coarse secondary lime masses; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 20 to 40 inches. The depth to bedrock is more than 60 inches. Reaction ranges from moderately acid to neutral in the surface layer and in the upper part of the solum. It is slightly alkaline or moderately alkaline in the lower part of the solum and in the substratum.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. Some pedons have an Ap horizon, which has hue similar to that of the A horizon and has value of 4 or 5 and chroma of 2 to 4. The texture is silt loam or silty clay loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is mottled in the lower part. It is silty clay or clay.

The C horizon has hue of 10YR or 2.5Y, value of 4

to 6, and chroma of 2 to 6. In most pedons it is stratified silty clay and clay having thin strata ranging from silty clay loam to sandy loam.

McGary Series

The McGary series consists of very deep, somewhat poorly drained soils that are slowly permeable or very slowly permeable. These soils formed in calcareous, stratified, clayey lacustrine material. They are on terraces along the Ohio River and its major tributaries in the northern part of the survey area. Slopes are mainly less than 2 percent but range up to 5 percent. The soils are fine, mixed, mesic Aeric Ochraqualfs.

McGary soils are on the same landscape as Markland, Wheeling, Sciotoville, and Weinbach soils. Markland and Wheeling soils are well drained. Sciotoville and Weinbach soils have a fragipan. Sciotoville soils are moderately well drained.

Typical pedon of McGary silt loam; in Meade County; about 2 miles southeast of Wolf Creek on Wolf Creek-Bend Road, 300 feet south of the road and a farmhouse, and 100 feet west of a farm lane; in a cultivated field; soil map sheet 7:

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; moderate fine granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.

Bt—7 to 21 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular and angular blocky structure; firm; common fine roots; few prominent stains and concretions of iron and manganese oxide; many distinct clay films on faces of peds; moderately acid; clear smooth boundary.

Btg—21 to 38 inches; grayish brown (10YR 5/2) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm; many prominent stains of iron and manganese oxide; many distinct clay films on faces of peds; common coarse secondary lime concretions in the lower part; slightly alkaline; clear smooth boundary.

C—38 to 64 inches; dark yellowish brown (10YR 4/4) silty clay; common medium distinct gray (10YR 5/1) mottles; massive; very firm; common coarse secondary lime concretions; moderately alkaline.

The thickness of the solum ranges from 24 to 40 inches. The depth to bedrock is more than 60 inches. The depth to carbonates ranges from 20 to 40 inches. Reaction ranges from moderately acid to neutral in the surface layer and in the upper part of the solum. It is slightly alkaline or moderately alkaline in the lower part of the solum and in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. Some pedons have an A horizon, which is similar in hue to the Ap horizon and has value of 3 or 4 and chroma of 1. This A horizon is underlain by an E horizon, which has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 6. It is mottled in shades of gray or brown. It is silty clay.

The C or Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 6. It is mottled in shades of gray and brown. It is stratified clay, silty clay, or silty clay loam.

Melvin Series

The Melvin series consists of very deep, poorly drained soils that are moderately permeable. These soils formed in mixed alluvium derived from limestone, sandstone, siltstone, shale, and loess. They are on flood plains and in alluvial depressions on uplands throughout the survey area. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

Melvin soils are on the same landscape as Nolin, Lindside, and Newark soils. Nolin soils are well drained, Lindside soils are moderately well drained, and Newark soils are somewhat poorly drained.

Typical pedon of Melvin silt loam, occasionally flooded; in Breckinridge County; about 14 miles north of Hardinsburg on Kentucky Highway 259, about 1.5 miles northwest of Ammons, 1,500 feet west of the highway, and 100 feet north of a farm pond; in a cultivated field; soil map sheet 21:

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine granular structure; very friable; many fine roots; neutral; abrupt smooth boundary.

Bg—7 to 25 inches; light brownish gray (10YR 6/2) silt loam; common medium prominent yellowish red (5YR 4/6) and yellowish brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine roots; few prominent stains and concretions of iron and manganese oxide; moderately acid; clear wavy boundary.

Cg—25 to 65 inches; gray (10YR 6/1) silty clay loam; common medium prominent yellowish red (5YR 5/8) and yellowish brown (10YR 5/8) mottles;

massive; firm; common prominent stains and concretions of iron and manganese oxide; slightly acid.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent to a depth of 30 inches and from 0 to 15 percent below that depth. The rock fragments are mostly rounded pebbles. Reaction ranges from moderately acid to slightly alkaline throughout the profile.

The Ap horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 3.

The Bg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 5 to 7. It has mottles in shades of brown, gray, or red. It is silt loam or silty clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It has mottles in shades of olive, yellow, brown, or red. It is silt loam or silty clay loam to a depth of about 40 inches. Below that, in some pedons, it is stratified loam, clay loam, silty clay, or fine sandy loam.

Newark Series

The Newark series consists of very deep, somewhat poorly drained soils that are moderately permeable. These soils formed in mixed alluvium derived from limestone, sandstone, siltstone, shale, and loess. They are on flood plains and in alluvial depressions on uplands throughout the survey area. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, nonacid, mesic Aeric Fluvaquents.

Newark soils are on the same landscape as Melvin, Lindside, and Nolin soils. Melvin soils are poorly drained, Lindside soils are moderately well drained, and Nolin soils are well drained.

Typical pedon of Newark silt loam, occasionally flooded; in Breckinridge County; about 14 miles north of Hardinsburg on Kentucky Highway 259, about 0.5 mile south of Ammons on Ammons-Stephensport Road, 500 feet southwest of a barn, and 400 feet east of the Ohio River; in a cultivated field; soil map sheet 21:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.

Bw—9 to 18 inches; mottled dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; few fine roots; common prominent concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg—18 to 30 inches; light brownish gray (10YR 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and few fine faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few fine roots; many prominent concretions of iron and manganese oxide; moderately acid; clear wavy boundary.

Cg—30 to 68 inches; light brownish gray (10YR 6/2) silt loam; many coarse prominent strong brown (7.5YR 5/6) mottles; massive; friable; many prominent stains and concretions of iron and manganese oxide; moderately acid.

The thickness of the solum ranges from 20 to 45 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to about 5 percent. The rock fragments are mostly rounded pebbles. Reaction ranges from moderately acid to slightly alkaline throughout the profile.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is mottled in shades of brown and gray. It is silt loam or silty clay loam.

The Bg horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It has mottles in shades of brown or gray. It is silt loam or silty clay loam.

The Cg horizon has colors and mottles similar to those of the Bg horizon. It is silt loam or silty clay loam. In some pedons it has thin strata of loam or fine sandy loam.

Nicholson Series

The Nicholson series consists of very deep, moderately well drained soils that have a fragipan. Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in a thin mantle of loess and in the underlying limestone residuum. They are on broad ridges, side slopes, and foot slopes in the uplands, mostly in the northeastern part of Meade County. Slopes range from 2 to 12 percent but are mostly less than 6 percent. The soils are fine-silty, mixed, mesic Typic Fragiudalfs.

Nicholson soils are on the same landscape as Crider, Hammack, Baxter, and Fredonia soils. Crider, Hammack, and Baxter soils are well drained and do not have a fragipan. Fredonia soils are less than 40 inches deep over bedrock.

Typical pedon of Nicholson silt loam, 2 to 6 percent slopes, eroded; in Meade County; about 3 miles west

of Muldraugh on Kentucky Highway 1638, about 1,000 feet southeast of the intersection of Kentucky Highways 1238 and 1638 at Lickskillet, and 400 feet west of Pellman Road; in a cultivated field; soil map sheet 27:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; many fine roots; neutral; abrupt smooth boundary.

Bt1—8 to 23 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on peds; very strongly acid; clear smooth boundary.

Btx1—23 to 33 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium and coarse subangular blocky; very firm and compact; brittle in about 40 percent of the horizon; common distinct dark brown (10YR 4/4) clay films on faces of peds and in pores; common distinct light gray (10YR 7/2) skeletans in the upper 3 inches; very strongly acid; gradual wavy boundary.

Btx2—33 to 43 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 60 percent of the horizon; common distinct brown (7.5YR 4/4) clay films on faces of peds and in pores; few sandstone pebbles 0.1 to 0.5 inch across; few prominent brown and black stains of iron and manganese oxide; very strongly acid; clear wavy boundary.

2Bt2—43 to 70 inches; yellowish red (5YR 5/6) gravelly silty clay; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium angular blocky structure; firm; common distinct clay films; 20 percent angular pebbles 1 to 3 inches across; strongly acid.

The thickness of the solum ranges from 40 to 80 inches. The depth to bedrock ranges from 60 to 100 inches. Depth to the fragipan ranges from 20 to 30 inches. The content of rock fragments ranges, by volume, from 0 to 20 percent in the 2Bt horizon and from 0 to 35 percent in the 2C horizon. In unlimed areas reaction ranges from very strongly acid to moderately acid above the fragipan and in the fragipan. It ranges from strongly acid to slightly acid below the fragipan.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is dominantly silt loam, but in severely eroded areas it ranges to silty clay loam.

The Bt1 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. In the lower part of some pedons, it has a few pale brown or light gray mottles. The horizon is silt loam or silty clay loam. Some pedons have a BE horizon, which has texture and colors similar to those of the Bt1 horizon.

The Btx horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 4 to 8. It has few to many mottles with chroma of 2 or less. It is silt loam or silty clay loam.

The 2Bt horizon has hue of 2.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. It has few to common mottles with chroma of 2 or less. The fine-earth fraction is silty clay loam, silty clay, or clay.

The 2C horizon, if it occurs, has hue of 2.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It has mottles with chroma of 2 or less. The fine-earth fraction is silty clay loam, silty clay, or clay.

Nolin Series

The Nolin series consists of very deep, well drained soils that are moderately permeable. These soils formed in mixed alluvium derived from limestone, sandstone, siltstone, shale, and loess. They are on flood plains and in alluvial depressions on uplands throughout the survey area. Slopes are mostly about 1 percent but range from 0 to 3 percent. The soils are fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts.

Nolin soils are on the same landscape as Lindside, Newark, Melvin, Elk, and Sciotoville soils. Lindside, Newark, and Melvin soils are on flood plains. Elk and Sciotoville soils are on stream terraces. Lindside and Sciotoville soils are moderately well drained, Newark soils are somewhat poorly drained, and Melvin soils are poorly drained. Elk and Sciotoville soils have an argillic horizon. Also, Sciotoville soils have a fragipan.

Typical pedon of Nolin silt loam, occasionally flooded; in Breckinridge County; about 2 miles northeast of Fairfield on Kentucky Highway 690, about 500 feet east of the highway, and 150 feet south of a small stream; in a cultivated field; soil map sheet 60:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; slightly acid; abrupt smooth boundary.

Bw1—8 to 28 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; very friable; few fine roots; few distinct dark brown (10YR 3/3) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Bw2—28 to 62 inches; dark yellowish brown (10YR

4/4) silt loam; common medium faint yellowish brown mottles; moderate fine and medium subangular blocky structure; friable; slightly acid; gradual smooth boundary.

C—62 to 72 inches; dark yellowish brown (10YR 4/4) silt loam; massive; firm; few fine roots; slightly acid.

The solum is more than 40 inches thick. The depth to bedrock ranges from 60 to more than 100 inches. The content of rock fragments ranges from 0 to 5 percent throughout. The rock fragments are mostly pebbles and cobbles. Reaction ranges from moderately acid to moderately alkaline throughout the profile.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

Some pedons have a BA horizon, which has colors and textures similar to those of the Ap horizon.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. In some pedons it has mottles with chroma of 2 or less below a depth of 24 inches. The horizon is silt loam or silty clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silty clay loam, silt loam, loam, fine sandy loam, or sandy loam.

Pekin Series

The Pekin series consists of very deep, moderately well drained soils that have a fragipan. Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in alluvium on stream terraces, mostly in the southeastern part of Breckinridge County. Slopes range from 0 to 6 percent. The soils are fine-silty, mixed, mesic Aquic Fragiudalfs.

Pekin soils are associated on the landscape with Crider and Nicholson soils on adjacent foot slopes and with Nolin soils on adjacent flood plains. Crider soils are well drained and do not have a fragipan. Nicholson soils are moderately well drained and have a fragipan. Nolin soils formed in alluvium and do not have an argillic horizon.

Typical pedon of Pekin silt loam, 0 to 2 percent slopes; in Breckinridge County; about 2 miles east of Bewleyville on Kentucky Highway 1238, about 500 feet south of the highway, 600 feet west of a farm road, and 200 feet south of a small stream; in a cultivated field; soil map sheet 40:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; very friable; few fine roots; slightly acid; abrupt smooth boundary.

Bt—10 to 18 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; very friable; few fine roots; common distinct clay films; few prominent black concretions and stains of iron and manganese oxide; moderately acid; clear smooth boundary.

Btx1—18 to 26 inches; brown (10YR 5/3) silt loam; common fine and medium distinct dark yellowish brown (10YR 4/6) and light grayish brown (10YR 6/2) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 40 percent of the horizon; common distinct clay films on faces of peds; common fine black concretions of iron and manganese oxide; moderately acid; gradual smooth boundary.

Btx2—26 to 35 inches; brown (10YR 5/3) silt loam; many medium distinct dark yellowish brown (10YR 4/6) and light grayish brown (10YR 6/2) mottles; moderate very coarse prismatic structure parting to moderate medium angular and subangular blocky; very firm and compact; brittle in about 70 percent of the horizon; common distinct clay films on faces of peds; common prominent black concretions and stains of iron and manganese oxide; strongly acid; gradual smooth boundary.

Btx3—35 to 50 inches; light grayish brown (10YR 6/2) silt loam; many medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium and coarse prismatic structure parting to moderate medium angular and subangular blocky; very firm and compact; brittle in about 70 percent of the horizon; common distinct clay films on faces of peds; common prominent black stains of iron and manganese oxide; strongly acid; gradual smooth boundary.

C—50 to 64 inches; light grayish brown (10YR 6/2) loam; massive; friable; 5 percent highly weathered sandstone fragments 0.1 inch to 4 inches long; many prominent black stains of iron and manganese oxide; very strongly acid.

The thickness of the solum ranges from 40 to 65 inches. The depth to bedrock ranges from 60 to more than 80 inches. Depth to the fragipan ranges from 24 to 32 inches. The content of rock fragments ranges, by volume, from 0 to 2 percent in the solum and from 0 to 5 percent in the C horizon. In unlimed areas reaction ranges from very strongly acid to moderately acid in the solum and from very strongly acid to neutral in the C horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is silt loam or silty clay loam.

The Btx horizon has hue of 10YR, value of 5 or 6,

and chroma of 2 to 6. It is mottled in shades of gray and brown. It silt loam or silty clay loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. It dominantly is silt loam, silty clay loam, or loam. In some pedons it has thin strata of fine sandy loam or fine sand.

Riney Series

The Riney series consists of very deep, well drained soils that are moderately rapidly permeable. These soils formed in material weathered from weakly consolidated sandstone and shale. They are on sloping to steep ridgetops and side slopes of the Sand Ridge area in the southeastern part of Meade County. Slopes range from 6 to 30 percent. The soils are fine-loamy, siliceous, mesic Typic Hapludults.

Riney soils are near Lily soils on the landscape. Lily soils are on adjacent side slopes. They are 20 to 40 inches deep over bedrock.

Typical pedon of Riney loam, 6 to 12 percent slopes, eroded; in Meade County; about 1.5 miles east of Flaherty on Kentucky Highway 1816, about 0.5 mile southwest on a gravel farm road, 1,200 feet southwest of the road, and 200 feet south of a field border; in a cultivated field; soil map sheet 42:

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

Bt1—8 to 20 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds and in pores; strongly acid; clear smooth boundary.

Bt2—20 to 30 inches; yellowish brown (10YR 5/6) sandy loam; moderate medium and coarse subangular blocky structure; friable; common prominent clay films on faces of peds and in pores; common fine roots; very strongly acid; clear smooth boundary.

Bt3—30 to 33 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine distinct light brownish gray (10YR 6/2) and many medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common prominent clay films on faces of peds; few fine roots; very strongly acid; clear smooth boundary.

Bt4—33 to 50 inches; red (2.5YR 4/6) sandy clay loam; many medium prominent strong brown (7.5YR 5/6) and common medium prominent light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; common prominent clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt5—50 to 62 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) sandy clay loam; weak coarse subangular blocky structure; friable; few distinct clay films; very strongly acid.

The thickness of the solum ranges from 40 to 80 inches. The depth to bedrock ranges from 60 to more than 96 inches. The content of rock fragments ranges from 0 to 10 percent in the upper part of the solum and from 0 to 20 percent in the lower part of the solum and in the substratum. The rock fragments are soft sandstone. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have a thin A horizon, which has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A horizon is underlain by an E horizon, which has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. The Ap or A horizon is loam or silt loam.

The upper part of the Bt horizon has hue of 10YR to 2.5YR, value of 4 or 5, and chroma of 4 to 8. The lower part has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth fraction of the Bt horizon is loam, clay loam, or sandy clay loam.

Some pedons have a BC or C horizon, which has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 3 to 6. The fine-earth fraction of the BC or C horizon is sandy clay loam, sandy loam, or fine sandy loam.

Robbs Series

The Robbs series consists of very deep, somewhat poorly drained soils that have a fragipan. Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in more than 4 feet of loess. They are in broad areas on uplands throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 0 to 3 percent. The soils are fine-silty, mixed, mesic Aquic Fragiudalfs.

Robbs soils are on the same landscape as Zanesville and Sadler soils. Sadler soils are moderately well drained. Zanesville soils are well drained or moderately well drained. Zanesville and Sadler soils do not have gray mottles in the upper 10 inches of the argillic horizon.

Typical pedon of Robbs silt loam; in Breckinridge County; 1,000 feet southwest of old U.S. Highway 60 in Hardinsburg, 800 feet south of Hooks Lane, and 300 feet southwest of a barn; in a cultivated field; soil map sheet 52:

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; very friable; neutral; abrupt smooth boundary.

Bt1—8 to 19 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) and common fine distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few distinct clay films on faces of peds; few black concretions and stains of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—19 to 22 inches; mottled yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and light brownish gray (10YR 6/2) silt loam; weak fine and medium subangular blocky structure; friable; few distinct clay films on faces of peds; few black concretions and stains of iron and manganese oxide; few discontinuous skeletans of white (10YR 8/2) silt on primary ped faces and in root channels; strongly acid; clear smooth boundary.

Btx1—22 to 42 inches; mottled yellowish brown (10YR 5/6 and 5/4) and light brownish gray (10YR 6/2) silt loam; moderate very coarse prismatic structure parting to moderate fine and medium subangular blocky; very firm and compact; brittle in about 50 percent of the horizon; common distinct clay films on faces of peds and in pores; few black concretions and stains of iron and manganese oxide; strongly acid; gradual wavy boundary.

Btx2—42 to 72 inches; mottled yellowish brown (10YR 5/6,) light yellowish brown (10YR 6/4), and light gray (10YR 7/1) silt loam; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 65 percent of the horizon; few discontinuous skeletans of white (10YR 8/1) silt between prisms; common distinct clay films in pores and on prism faces; common black stains and concretions of iron and manganese oxide; very strongly acid.

The thickness of the solum ranges from 40 to 75 inches. The depth to bedrock ranges from 60 to more than 80 inches. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile. The content of rock fragments ranges from 0 to 10 percent below a depth of about 55 inches.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Pedons in wooded areas have a thin A horizon, which is 1 to 4 inches thick and has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It has few to many mottles in shades of brown and gray. It is silt loam or silty clay loam.

The Btx horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 to 8. It has mottles in shades of brown and gray. It is silt loam or silty clay loam.

The 2C horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. It has few to many mottles in shades of brown and gray. It is loam, sandy loam, silt loam, or silty clay loam.

Rosine Series

The Rosine series consists of very deep, well drained soils that are moderately slowly permeable. These soils formed in a thin mantle of loess and in the underlying material weathered from interbedded shale and siltstone. They are on side slopes and narrow ridgetops, mostly in the western and northern parts of the survey area. Slopes range from 6 to 30 percent. The soils are fine-silty, mixed, mesic Ultic Hapludalfs.

Rosine soils are on the same landscape as Alford, Crider, Gilpin, Caneyville, and Lenberg soils. Alford soils formed in more than 4 feet of loess. Crider soils formed in a thin mantle of loess and in the underlying clayey limestone residuum. Caneyville, Lenberg, and Gilpin soils are less than 40 inches deep over bedrock. Also, Caneyville and Lenberg soils are clayey in the control section. Gilpin soils formed in loamy sandstone residuum.

Typical pedon of Rosine silt loam, in an area of Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, eroded; in Breckinridge County; about 1 mile south of Glen Dean on McQuady-Glen Dean-Falls of Rough Road, 1 mile east on Whittinghill-Owens Cemetery Road, 800 feet east of an abandoned schoolhouse, and 100 feet north of a farm road; in a deciduous forest; soil map sheet 68:

Oi—1 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 2 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

E—2 to 7 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Bt1—7 to 21 inches; yellowish brown (10YR 5/6) silt loam; moderate medium and coarse subangular blocky structure; friable; many medium and coarse roots; few distinct patchy clay films in pores; very strongly acid; clear wavy boundary.

2Bt2—21 to 29 inches; yellowish brown (10YR 5/6) channery silty clay loam; common medium distinct light olive brown (2.5Y 5/6) and pale brown (10YR 6/3) mottles; moderate medium subangular blocky

structure; firm; many fine and medium roots; common distinct clay films in pores and on faces of peds; 20 percent shale fragments and 3 percent sandstone fragments 0.1 inch to 2 inches across; very strongly acid; gradual wavy boundary.

2Bt3—29 to 46 inches; strong brown (7.5YR 5/6) channery silty clay loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; common distinct clay films on faces of peds and in pores; 25 percent sandstone channers and 5 percent flagstones; very strongly acid; gradual wavy boundary.

2BC—46 to 54 inches; mottled strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) silty clay; moderate coarse subangular blocky structure; firm; few fine and medium roots; 6 percent sandstone fragments 0.1 to 0.5 inch across; very strongly acid; clear wavy boundary.

2C—54 to 64 inches; strong brown (7.5YR 5/6) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and few medium prominent yellowish red (5YR 4/6) mottles; massive; firm; few fine and medium roots; 5 percent sandstone fragments 0.1 to 0.5 inch across; very strongly acid; clear wavy boundary.

2Cr—64 to 78 inches; strong brown (7.5YR 5/8) siltstone; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) silty clay coatings on partings; few fine roots in widely spaced cracks; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to soft siltstone or shale ranges from 60 to 80 inches. The content of rock fragments ranges from 0 to 5 percent in the upper part of the solum, from 0 to 30 percent in the lower part of the solum, and from 5 to 60 percent in the C horizon. The rock fragments are siltstone, sandstone, or shale. Reaction is very strongly acid or strongly acid in the solum. It ranges from very strongly acid to slightly acid in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Some pedons have an Ap horizon, which has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. The A or Ap horizon is silt loam or silty clay loam.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 5. It is silt loam or silty clay loam.

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

The 2Bt horizon has hue of 10YR to 2.5YR, value of 5 to 7, and chroma of 3 to 6. It is mottled in shades of gray and brown. The fine-earth fraction is silty clay loam, silty clay, or clay.

The 2C horizon has hue of 2.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 6. The fine-earth fraction is silty clay loam, silty clay, or clay.

Sadler Series

The Sadler series consists of very deep, moderately well drained soils that have a fragipan (figs. 31 and 32). Permeability is moderate above the fragipan and slow in the fragipan. These soils formed in a thin mantle of loess and in the underlying material weathered from sandstone, siltstone, and shale. They are on broad ridgetops on uplands throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 0 to 6 percent. The soils are fine-silty, mixed, mesic Glossic Fragiudalfs.

Sadler soils are on the same landscape as Zanesville and Robbs soils. Zanesville soils are on narrow, convex ridgetops. They are well drained or moderately well drained. Robbs soils are somewhat poorly drained.

Typical pedon of Sadler silt loam, 2 to 6 percent slopes, eroded; in Breckinridge County; about 0.5 mile south of Hardinsburg on Kentucky Highway 261, about 800 feet east on U.S. Highway 60, and 200 feet north of the highway; in a pasture; soil map sheet 52:

Ap1—0 to 2 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Ap2—2 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; very friable; common fine roots; few dark brown concretions of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; friable; common fine roots; few distinct clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt2—14 to 21 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; few fine pores; very strongly acid; gradual smooth boundary.

E/B—21 to 26 inches; silt loam, 70 percent brown (10YR 5/3) E part surrounding 30 percent yellowish brown (10YR 5/6) B peds; weak fine subangular blocky structure; very friable; few fine roots; few prominent black concretions of iron and manganese oxide; few fine pores; very strongly acid; clear wavy boundary.

Btx1—26 to 38 inches; strong brown (7.5YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate coarse prismatic structure parting to weak coarse subangular blocky; very firm and compact; brittle in about 40 percent of the horizon; common distinct clay films on faces of peds; few fine roots in gray streaks; few prominent black concretions of iron and manganese oxide; 1 percent sandstone pebbles 0.1 to 0.5 inch across in the lower part of the horizon; very strongly acid; gradual wavy boundary.

2Btx2—38 to 59 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate very coarse prismatic structure parting to weak coarse subangular blocky; very firm and compact; brittle in about 60 percent of the horizon; few distinct clay films on faces of peds; few fine roots in gray streaks between prisms; few prominent black stains of iron and manganese oxide; 5 percent sandstone pebbles 0.1 to 0.5 inch across; strongly acid; gradual smooth boundary.

2C—59 to 76 inches; mottled yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) very gravelly fine sandy loam; massive; firm; 60 percent sandstone fragments 0.1 inch to 3 inches across; strongly acid.

The thickness of the solum ranges from 40 to 70 inches. The depth to bedrock ranges from 60 to 100 inches. The thickness of the loess mantle ranges from 20 to 48 inches. Depth to the fragipan ranges from 18 to 32 inches. The content of rock fragments ranges from 1 to 20 percent in the 2Btx horizon and from 5 to 60 percent in the 2C horizon. The rock fragments are sandstone or siltstone. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

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

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is silt loam or silty clay loam.

The E part of the E/B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. It makes up 55 to 70 percent of the E/B horizon. It is silt or silt loam. The B part of the E/B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is silt loam or silty clay loam.

The matrix and mottles of the Btx horizon have hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. The horizon is silt loam, silty clay loam, or loam.

The matrix and mottles of the 2Btx horizon have hue of 7.5YR to 5Y, value of 4 to 6, and chroma or 1 to 6. The fine-earth fraction is silt loam, silty clay loam, or clay loam.

The 2C horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 1 to 6. The fine-earth fraction ranges from fine sandy loam to silty clay.

Sciotoville Series

The Sciotoville series consists of very deep, moderately well drained soils that have a fragipan (fig. 33). Permeability is moderate above the fragipan and moderately slow or slow in the fragipan. These soils formed in old, mixed alluvium derived from sandstone, siltstone, shale, limestone, and loess. They are on stream terraces along the Ohio River and its major tributaries. Slopes range from 0 to 6 percent. The soils are fine-silty, mixed, mesic Aquic Fragiudalfs.

The Sciotoville soils in this survey area are taxadjuncts to the Sciotoville series. They have more sand in the control section than allowed in the series. This difference, however, does not significantly affect the use and management or behavior of the soils. The Sciotoville soils in this survey area are classified as fine-loamy, mixed, mesic Aquic Fragiudalfs.

Sciotoville soils are on the same landscape as Weinbach, Elk, and Wheeling soils. Weinbach soils are somewhat poorly drained. Elk and Wheeling soils are well drained. They do not have a fragipan.

Typical pedon of Sciotoville silt loam, 2 to 6 percent slopes; in Breckinridge County; about 3 miles west of Mooleyville on Kentucky Highway 259, about 1 mile north on Grady-Frymire Road in Yellowbank Wildlife Management Area, 100 feet northwest of a gravel road, and 200 feet north of an abandoned farmhouse; in a cultivated field; soil map sheet 9:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; few prominent dark grayish brown (10YR 4/2) organic stains; many fine roots; moderately acid; abrupt smooth boundary.

BA—9 to 14 inches; yellowish brown (10YR 5/4) silt loam; 10 percent fine pieces of brown (10YR 4/3) A material in wormholes; weak medium subangular blocky structure; very friable; common fine roots; common fine wormcasts; moderately acid; clear smooth boundary.

Bt—14 to 28 inches; yellowish brown (10YR 5/6) silt loam; few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds and in root channels; common prominent black and red stains of iron and manganese oxide; few fine roots; few fine mica flakes; very strongly acid; clear smooth boundary.

Btx1—28 to 41 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium and coarse subangular blocky; very firm and compact; brittle in about 60 percent of the horizon; common distinct clay films on faces of peds; few prominent black stains of iron and manganese oxide; few fine mica flakes; very strongly acid; clear smooth boundary.

Btx2—41 to 53 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and common medium prominent strong brown (7.5YR 5/8) mottles; moderate very coarse prismatic structure; very firm and compact; brittle in about 70 percent of the horizon; common distinct clay films in pores; light brownish gray (10YR 6/2) silt coatings 5 to 15 millimeters thick between prisms; common fine mica flakes; few prominent black stains of iron and manganese oxide; very strongly acid; clear wavy boundary.

C1—53 to 65 inches; dark yellowish brown (10YR 4/4) silt loam; few medium distinct light brownish gray (10YR 6/2) and few medium prominent strong brown (7.5YR 5/8) mottles; massive; friable; 14 percent pebbles 0.1 to 0.5 inch across; common distinct silt coatings around pebbles; few fine mica flakes; few prominent black stains of iron and manganese oxide; very strongly acid; gradual wavy boundary.

C2—65 to 75 inches; dark yellowish brown (10YR 4/4) silt loam; few medium distinct grayish brown (10YR 5/2) mottles; massive; friable; few fine mica flakes; few thin strata of loam; strongly acid.

The thickness of the solum ranges from 45 to 65 inches. The depth to bedrock is more than 72 inches. Depth to the fragipan ranges from 18 to 32 inches. The content of rock fragments ranges from 0 to 2 percent in the solum and from 0 to 15 percent in the C horizon. In unlimed areas reaction is very strongly acid or strongly acid in the solum. It ranges from very strongly acid to slightly acid in the C horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 or 3.

The BA horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 5.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. In the upper 10 inches it has mottles with chroma of 2 or less. The texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It has common to many mottles in shades of gray and brown. It is silt loam, silty clay loam, or loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is silt loam, loam, or sandy loam. It is commonly stratified.

Steff Series

The Steff series consists of very deep, moderately well drained soils that are moderately permeable. These soils formed in mixed acid alluvium derived from sandstone, siltstone, shale, and loess. They are on flood plains in narrow valleys and near the larger streams in Breckinridge County. Slopes are mostly 0 to 2 percent but range up to 4 percent. The soils are fine-silty, mixed, mesic Fluvaquentic Dystrochrepts.

Steff soils are on the same landscape as Cuba and Stendal soils. Cuba soils are well drained, and Stendal soils are somewhat poorly drained.

Typical pedon of Steff silt loam, occasionally flooded; in Breckinridge County; 500 feet south of old U.S. Highway 60 at the western edge of Hardinsburg and 50 feet east of Hardins Creek; in an idle pasture; soil map sheet 52:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Bw1—8 to 22 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; many fine roots; strongly acid; clear smooth boundary.

Bw2—22 to 43 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct dark grayish brown (10YR 4/2) and many medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid.

Bw3—43 to 49 inches; mottled light brownish gray (10YR 7/1) and strong brown (7.5YR 5/6 and 5/8) silt loam; weak fine and medium granular structure; friable; 5 percent sandstone pebbles 0.1 to 1 inch across; common distinct dark brown stains and concretions of iron and manganese oxide; very strongly acid; clear smooth boundary.

C—49 to 63 inches; mottled light brownish gray (10YR 7/1) and strong brown (7.5YR 5/6) stratified silt loam; massive; friable, 5 percent sandstone pebbles 0.1 to 1 inch across; common distinct dark brown stains and concretions of iron and manganese oxide; very strongly acid.

The thickness of the solum ranges from 24 to 50 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent to a depth of about 40 inches and from 0 to 50 percent below that depth. The rock fragments are mainly sandstone or siltstone pebbles. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. Some pedons have a thin A horizon, which has hue similar to that of the Ap horizon and has value of 3 and chroma of 2 or 3.

The Bw1 horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. It has mottles in shades of gray or brown. It is silt loam or silty clay loam.

The Bw2 horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It has mottles in shades of gray or brown. It is silt loam or silty clay loam.

The matrix and mottles of the Bw3 horizon, if it occurs, have hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 6. The horizon is silt loam or silty clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 6. The fine-earth fraction is silt loam, loam, or fine sandy loam. The horizon generally is stratified.

Stendal Series

The Stendal series consists of very deep, somewhat poorly drained soils that are moderately permeable. These soils formed in mixed acid alluvium derived from sandstone, siltstone, shale, and loess. They are on flood plains in narrow valleys and near the larger streams in Breckinridge County. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, acid, mesic Aeric Fluvaquents.

Stendal soils are on the same landscape as Cuba, Steff, and Newark soils. Cuba soils are well drained. Steff soils are moderately well drained. Newark soils are less acid in the control section than the Stendal soils.

Typical pedon of Stendal silt loam, occasionally flooded; in Breckinridge County; about 1 mile northeast of Falls of Rough on the McQuady-Glen Dean-Falls of Rough Road, 0.25 mile north of the confluence of Rock Lick Creek and Rough River, and 100 feet east of Rock Lick Creek; in a brushy pasture; soil map sheet 68:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; few fine roots; moderately acid; abrupt smooth boundary.

C—8 to 20 inches; mottled light brownish gray (10YR 6/2) and brown (10YR 4/3) silt loam; weak coarse subangular blocky structure; very friable; strongly acid; gradual smooth boundary.

Cg—20 to 64 inches; light brownish gray (10YR 6/2) silt loam; common medium faint brown mottles; massive; very friable; strongly acid.

The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent. The rock fragments are mainly sandstone or siltstone pebbles. In unlimed areas reaction is very strongly acid or strongly acid throughout the profile.

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

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 6. It is mottled in shades of gray and brown. It is silt loam or silty clay loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is mottled in shades of gray and brown. It is dominantly silt loam or silty clay loam. In some pedons it has thin strata of fine sandy loam or loam below a depth of 40 inches.

Varilla Series

The Varilla series consists of very deep, somewhat excessively drained soils that are moderately rapidly permeable. These soils formed in rocky loamy colluvium derived from acid sandstone. They are on side slopes in the western and northern parts of the survey area. Slopes range from 20 to 65 percent. The soils are loamy-skeletal, siliceous, mesic Typic Dystrochrepts.

Varilla soils are on the same landscape as Gilpin, Rosine, and Caneyville soils. Gilpin and Caneyville soils are moderately deep to bedrock. Caneyville soils are clayey and are underlain by limestone. Rosine soils are in a fine-silty family.

Typical pedon of Varilla stony sandy loam, in an area of Varilla-Gilpin-Rock outcrop complex, very bouldery, 20 to 65 percent slopes; in Breckinridge County; about 2 miles northwest of Balltown on Kentucky Highway 992, about 2 miles north on Cloverport-Balltown Road, 35 feet east of the road, and 400 feet east of Tar Fork; in a deciduous forest; soil map sheet 43:

Oi—1 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 2 inches; dark grayish brown (10YR 4/2) stony sandy loam; weak fine granular structure; very friable; common fine and medium roots; 15 percent sandstone flagstones and channers 0.1 inch to 15 inches across; strongly acid; abrupt smooth boundary.

EB—2 to 6 inches; dark grayish brown (10YR 4/2) loam; common medium distinct yellowish brown (10YR 6/4) mottles; weak fine granular and moderate medium subangular blocky structure; very friable; common fine roots; 10 percent sandstone channers 0.1 inch to 6 inches long; very strongly acid; clear smooth boundary.

Bw1—6 to 13 inches; dark yellowish brown (10YR 4/4) very channery loam; weak fine granular structure; friable; many fine to coarse roots; few fine pores; 50 percent sandstone channers 0.1 inch to 6 inches long and 5 percent flagstones 6 to 15 inches long; very strongly acid; gradual smooth boundary.

Bw2—13 to 24 inches; yellowish brown (10YR 5/6) very channery sandy loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; 55 percent sandstone channers 0.1 inch to 6 inches long; very strongly acid; gradual wavy boundary.

Bw3—24 to 36 inches; yellowish brown (10YR 5/6) extremely channery sandy loam; moderate medium subangular blocky structure; firm; common fine and medium roots; few fine pores; common distinct silt coatings in root channels and pores; 59 percent sandstone channers 0.1 inch to 6 inches long and 5 percent flagstones 6 to 15 inches long; very strongly acid; gradual wavy boundary.

Bw4—36 to 62 inches; yellowish brown (10YR 5/6) extremely channery sandy loam; weak coarse subangular blocky structure; very firm; few fine roots to a depth of 48 inches; few fine pores; common distinct silt coatings in root channels and pores; 75 percent sandstone channers 0.1 inch to 6 inches long; very strongly acid; gradual wavy boundary.

R—62 inches; yellowish brown, hard sandstone bedrock.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 15 to 75 percent in individual horizons of the solum and from 35 to 90 percent in the C horizon. The rock fragments are mainly channers and stones. Reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. In some pedons it is thin and has value of 3 and chroma of 1 to 3.

The EB horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The fine-earth fraction is sandy loam, fine sandy loam, loam, or silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The fine-earth fraction is sandy loam, fine sandy loam, loam, or silt loam.

The BC or C horizon, if it occurs, has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 3 to 6. The fine-earth fraction of the BC and C horizons dominantly is loamy sand, sandy loam, or fine sandy loam, but the range includes loam.

Weinbach Series

The Weinbach series consists of very deep, somewhat poorly drained soils that have a fragipan. Permeability is moderate above the fragipan and very slow in the fragipan. These soils formed in mixed alluvium derived from sandstone, siltstone, shale, limestone, and loess. They are on stream terraces along the Ohio River and its major tributaries. Slopes range from 0 to 2 percent. The soils are fine-silty, mixed, mesic Aeric Fragiaqualfs.

Weinbach soils are on the same landscape as Sciotoville, Elk, and Wheeling soils. Sciotoville soils are moderately well drained. Elk and Wheeling soils are well drained. They do not have a fragipan.

Typical pedon of Weinbach silt loam; in Breckinridge County; about 14 miles north of Hardinsburg on Kentucky Highway 259, about 1.5 miles northwest of Ammons, 2,000 feet west of the highway, 350 feet north of a farm lane, and 2,500 feet east of the Ohio River; in a cultivated field; soil map sheet 14:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; common fine dark brown concretions of iron and manganese oxide; slightly acid; abrupt smooth boundary.

E—9 to 17 inches; brown (10YR 5/3) silt loam; many medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common fine roots; few fine dark brown and black concretions of iron and manganese oxide; very strongly acid; clear wavy boundary.

BE—17 to 27 inches; mottled grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine mica flakes; common prominent black stains of iron and manganese oxide; very strongly acid; clear wavy boundary.

Btx—27 to 45 inches; mottled grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) silty clay loam; moderate very coarse prismatic structure parting to moderate medium and coarse subangular blocky; very firm and compact; brittle in about 50 percent of the horizon; common distinct clay films on faces of peds; common fine mica flakes;

common medium black stains of iron and manganese oxide; very strongly acid; clear wavy boundary.

Bt—45 to 56 inches; brown (10YR 4/3) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; few patchy clay films; common fine mica flakes; common prominent black stains of iron and manganese oxide; very strongly acid; gradual wavy boundary.

C—56 to 65 inches; brown (10YR 4/3) loam; massive; few thin stratified layers of fine sandy loam or loamy sand; common fine mica flakes; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 65 inches. Depth to the fragipan ranges from 20 to 32 inches. In unlimed areas reaction is very strongly acid or strongly acid in the solum. It ranges from very strongly acid to moderately acid in the C horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. It is mottled in shades of gray and brown. It is silt loam or silty clay loam.

The BE horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 2 to 6. It is mottled. It is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It has mottles in shades of gray and brown. It is silt loam or silty clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 6. It has mottles in shades of gray and brown. It is silt loam or silty clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. It is dominantly silt loam, loam, silty clay loam, or clay loam. It has thin strata of sand or loamy sand.

Westmoreland Series

The Westmoreland series consists of deep, well drained soils that are moderately permeable. These soils formed in material weathered from siltstone, sandstone, and limestone. They are on steep side slopes of the Muldraugh escarpment in the northeastern part of Meade County. Slopes range from 30 to 50 percent. The soils are fine-loamy, mixed, mesic Ultic Hapludalfs.

Westmoreland soils are on the same landscape as Gilpin, Dekalb, Rosine, and Caneyville soils. Gilpin and Dekalb soils are moderately deep. They have less than 35 percent base saturation. Rosine soils are in a fine-silty family. They formed in a thin layer of loess and in clayey shale residuum. Caneyville soils are moderately deep over limestone. They have more than 35 percent clay in the subsoil.

Typical pedon of Westmoreland silt loam, in an area of Westmoreland-Caneyville-Rock outcrop complex, 30 to 80 percent slopes; in Meade County; about 2 miles north of Muldraugh, on the Fort Knox Military Reservation, 1,500 feet east of Railroad Tressel Road, and 300 feet north of a small tributary stream; in a deciduous forest; soil map sheet 20:

Oi—1/2 inch to 0; slightly decomposed hardwood leaf litter, twigs, and roots.

A—0 to 3 inches; dark brown (10YR 3/3) silt loam; moderate fine and medium granular structure; very friable; many fine and medium roots; neutral; abrupt smooth boundary.

AB—3 to 6 inches; 60 percent dark brown (10YR 3/3) and 40 percent yellowish brown (10YR 5/4) silt loam; moderate fine and medium subangular blocky structure; very friable; many fine and medium roots; 5 percent siltstone channers 0.1 inch to 3 inches long; slightly acid; clear smooth boundary.

Bt1—6 to 15 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots; few distinct clay films on faces of peds; many distinct silt coatings between peds and fragments; 10 percent siltstone channers 0.1 inch to 3 inches long; moderately acid; clear smooth boundary.

Bt2—15 to 28 inches; strong brown (7.5YR 5/6) channery silt loam; moderate medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds; 25 percent siltstone channers 0.1 inch to 4 inches long; moderately acid; clear smooth boundary.

Bt3—28 to 40 inches; strong brown (7.5YR 5/8) silt loam; common medium prominent light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; 10 percent channers 0.1 inch to 4 inches long; common distinct clay films on faces of peds and on fragments; moderately acid; clear smooth boundary.

BC—40 to 48 inches; mottled strong brown (7.5YR 5/6) and brownish yellow (10YR 6/6) channery silty clay loam; weak fine subangular blocky structure; firm; few fine and medium roots; 20 percent siltstone channers 0.1 inch to 4 inches long; few faint clay films on faces of peds; moderately acid; clear wavy boundary.

R—48 inches; siltstone bedrock.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock ranges from 40 to 60 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer, from 0 to 30 percent in individual horizons of the subsoil, and from 5 to 50 percent in the BC or C horizon. The rock fragments are siltstone, sandstone, or limestone channers and cobbles. In unlimed areas reaction ranges from very strongly acid to moderately acid in the solum. It is strongly acid or moderately acid in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The AB horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth fraction is silt loam, loam, or silty clay loam.

The BC or C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. The fine-earth fraction is loam, silt loam, or silty clay loam.

Wheeling Series

The Wheeling series consists of very deep, well drained soils that are moderately permeable. These soils formed in mixed alluvium derived from sandstone, siltstone, shale, limestone, and loess. They are on stream terraces along the Ohio River and its major tributaries. Slopes range from 2 to 12 percent. The soils are fine-loamy, mixed, mesic Ultic Hapludalfs.

Wheeling soils are on the same landscape as Elk, Sciotoville, and Weinbach soils. Elk soils are on adjacent stream terraces. They are in a fine-silty family. Sciotoville and Weinbach soils also are in a fine-silty family. They have a fragipan. Sciotoville soils are moderately well drained, and Weinbach soils are somewhat poorly drained.

Typical pedon of Wheeling fine sandy loam, 2 to 6 percent slopes; in Breckinridge County; about 1.5 miles south of Addison on Kentucky Highway 144, about 100 feet east of the highway, and 100 feet north of an old abandoned substation; in a cultivated field; inset to soil map sheet 14:

Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; 1 percent pebbles 0.1 to 1 inch across; slightly acid; abrupt smooth boundary.

E—8 to 15 inches; yellowish brown (10YR 5/4) loam; moderate medium granular structure; very friable; slightly acid; clear smooth boundary.

Bt1—15 to 32 inches; dark yellowish brown (10YR 4/4) loam; moderate medium and coarse subangular blocky structure; friable; common distinct clay films on faces of peds and in root channels; very strongly acid; clear smooth boundary.

Bt2—32 to 50 inches; dark yellowish brown (10YR 4/4) loam; weak coarse subangular blocky structure; friable; common distinct clay films on faces of peds and in pores and root channels; few fine mica flakes; few prominent dark brown and black stains of iron and manganese oxide; very strongly acid; gradual wavy boundary.

C—50 to 77 inches; dark yellowish brown (10YR 4/4) loam; massive; friable; few thin strata of fine sandy loam below a depth of 60 inches; few fine mica flakes; 1 percent rounded pebbles 0.1 to 1 inch across; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 14 percent in the surface layer, from 0 to 25 percent in the subsoil, and from 0 to 50 percent in the C horizon. The rock fragments are mainly rounded pebbles and cobbles. In unlimed areas reaction ranges from strongly acid to moderately acid throughout the profile.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have a thin A horizon, which has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3.

The E horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 2 to 4. It is fine sandy loam, sandy loam, loam, or silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The fine-earth fraction is loam, silt loam, or silty clay loam.

The C horizon has colors similar to those of the Bt horizon. The fine-earth fraction is stratified with textures ranging from very fine sand to loam.

Yeager Series

The Yeager series consists of very deep, well drained soils that are moderately rapidly or rapidly permeable. These soils formed in recent, sandy alluvium. They are on flood plains along the Ohio River. Slopes are mostly 0 to 2 percent but range to 3 percent. The soils are sandy, mixed, mesic Typic Udifluvents.

Yeager soils are on the same landscape as Chagrin, Huntington, Lindside, and Newark soils. Chagrin soils are in a fine-loamy family. Huntington soils have a mollic epipedon. They are in a fine-silty family. Lindside soils are moderately well drained, and Newark soils are somewhat poorly drained. Also, Lindside and Newark soils are in a fine-silty family.

Typical pedon of Yeager loamy sand, occasionally flooded; in Meade County; about 6 miles north of Battletown on Kentucky Highway 1047, about 2,100 feet south of the highway, at the southern end of Big Bend bottoms, 400 feet west of a field boundary, and 300 feet north of the Ohio River; in a hayfield; soil map sheet 1:

Ap—0 to 9 inches; dark brown (10YR 3/3) loamy sand; weak fine and medium granular structure; very friable; few fine roots; common fine mica flakes; neutral; abrupt smooth boundary.

C1—9 to 31 inches; yellowish brown (10YR 5/6) loamy sand; structureless; very friable; few fine roots; common fine mica flakes; neutral; clear smooth boundary.

C2—31 to 41 inches; brown (10YR 4/3) loamy sand; many medium faint brown and many medium prominent yellowish red (5YR 4/6) mottles; structureless; very friable; few fine roots; common fine mica flakes; common fine coal flakes; 10 percent pebbles 0.1 to 0.5 inch across; neutral; abrupt smooth boundary.

C3—41 to 49 inches; yellowish brown (10YR 5/4) sand; structureless but contains bedding planes of loamy sand; very friable; common fine mica flakes; common fine coal flakes; neutral; clear smooth boundary.

C4—49 to 58 inches; yellowish brown (10YR 5/4) sandy loam; many medium prominent red (2.5YR 4/8) mottles; structureless; very friable; common fine mica flakes; common fine coal flakes; slightly acid; clear smooth boundary.

C5—58 to 67 inches; yellowish brown (10YR 5/6) sand; many medium prominent red (2.5YR 4/8) mottles; structureless; very friable; common fine mica flakes; common fine coal flakes; neutral.

These soils are 40 to more than 70 inches deep over unconsolidated silty, loamy, sandy, or gravelly material. The content of rock fragments ranges from 0 to 14 percent to a depth of 40 inches and from 0 to 50 percent below a depth of 40 inches. The rock fragments are mostly rounded pebbles. Reaction ranges from strongly acid to neutral throughout the profile.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. It is loam, sandy loam, loamy sand, or sand.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 8. It is mottled in shades of brown, yellow, or red. The fine-earth fraction is sandy loam, loamy sand, or sand. Most pedons have lenses or bedding planes ranging from loam to sand.

Zanesville Series

The Zanesville series consists of deep, well drained or moderately well drained soils that have a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in the fragipan. These soils formed in a thin mantle of loess and in the underlying material weathered from sandstone, siltstone, and shale. They are on ridgetops and on the upper side slopes throughout Breckinridge County and in the northwestern part of Meade County. Slopes range from 2 to 12 percent. The soils are fine-silty, mixed, mesic Typic Fragiudalfs.

Zanesville soils are on the same landscape as Sadler and Robbs soils. Sadler soils are on adjacent, broad ridgetops in the uplands. They have a glossic horizon above the fragipan. Robbs soils are somewhat poorly drained. They have gray mottles in the upper 10 inches of the argillic horizon.

Typical pedon of Zanesville silt loam, 2 to 6 percent slopes, eroded; in Breckinridge County; about 7 miles south of Harned on Kentucky Highway 259, about 1 mile south of Roff on McCoy-Roff Road, 800 feet east of the highway, and 200 feet southwest of a barn; in a pasture; soil map sheet 64:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; slightly acid; abrupt smooth boundary.

Bt1—9 to 20 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—20 to 23 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds and in pores; very strongly acid; abrupt smooth boundary.

Btx1—23 to 39 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle in about 45 percent of the horizon; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; very strongly acid; clear wavy boundary.

2Btx2—39 to 55 inches; yellowish brown (10YR 5/6) silt loam; common medium faint brownish yellow and common medium distinct light brownish gray (10YR 6/2) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm and compact; brittle

in about 60 percent of the horizon; common distinct clay films on faces of peds; common prominent black stains of iron and manganese oxide; 2 percent sandstone fragments 0.1 to 0.5 inch long; very strongly acid; clear wavy boundary.

2C—55 to 59 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) and few fine distinct strong brown (7.5YR 5/6) mottles; firm; very strongly acid; clear wavy boundary.

2R—59 inches; unweathered sandstone bedrock.

The thickness of the solum ranges from 35 to 60 inches. Depth to the fragipan ranges from 20 to 32 inches. The depth to bedrock ranges from 40 to 60 inches. The content of rock fragments ranges from 0 to 15 percent in the 2Btx horizon and from 5 to 50 percent in the 2C horizon. In unlimed areas reaction ranges from very strongly acid to moderately acid throughout the profile.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or silty clay loam. Some pedons have a thin A horizon and an E horizon, which have hues similar to those of the Ap horizon. The A horizon has value of 2 to 4 and chroma of 1 to 3. The E horizon has value of 5 and chroma of 3 to 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is mottled in shades of brown and gray below a depth of 20 inches. It is silt loam or silty clay loam.

The Btx and 2Btx horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. They have few to many brown or gray mottles. The fine-earth fraction is silty clay loam, silt loam, or loam.

The 2C horizon and the 2B horizon, if it occurs, have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. They have mottles in shades of brown or gray. The fine-earth fraction is silty clay loam, silt loam, or loam. Some pedons have a thin 2Cr horizon of interbedded sandstone, siltstone, and shale.

Formation of the Soils

Soils are individual natural bodies formed through the interaction of five major factors of formation. These factors are climate, parent material, plant and animal life, relief, and time (Donahue, Shickluna, and Robertson 1971). Climate and plant and animal life act on the parent material. Their effects on soil formation are controlled by the amount of time that they have been active and by relief, or lay of the land. Each factor modifies the effects of the other four. The relative influence of each factor differs from place to place and determines varying characteristics of the soils.

Climate

Climate generally is the most important factor of soil formation. It influences soil formation primarily through the effects of temperature and precipitation (Donahue, Shickluna, and Robertson 1971). It affects the weathering of rocks and minerals, the susceptibility of the soils to erosion, and the kind and number of plants and animals on and in the soil. As water percolates downward through the soils, it leaches soluble bases from the soils and moves particles of clay to the lower layers.

The climate of Breckinridge and Meade Counties is humid and temperate. The average annual precipitation is about 48 inches, and the average air temperature is about 54 degrees F. Because the soils in the survey area are not dry or frozen for long periods, the processes of soil formation have continued almost uninterrupted. This almost continual process has leached many of the soluble bases and clay minerals from upper to lower horizons within the soil and, in some instances, has leached them completely from the soil. As a result, many of the soils in the survey area are acid, have a loamy surface layer, and have accumulated clay in the subsoil. Sadler, Crider, and Rosine soils are examples. For more detailed information on the climate of the survey area, see the section "General Nature of the Survey Area."

Parent Material

Parent material is the unconsolidated mass in which soils form. It can be weathered in place, or it can be transported and deposited by wind, ice, water, and gravity. The soils in Breckinridge and Meade Counties formed in loess (Macneal unpublished), residuum, and alluvium (see table 23).

Loess is wind-deposited material that consists mostly of silt-sized particles. Loess is on most of the uplands and is thickest on the gentle slopes and thinnest on the steepest slopes. Some deposits of loess are more than 4 feet thick. Alford, Hosmer, and Robbs soils formed in a thick deposit of loess. Other soils formed partly in a thin mantle of loess and partly in the underlying bedrock residuum. Sadler and Zanesville soils formed in a thin mantle of loess and in the underlying sandstone and siltstone residuum. They are loamy in the subsoil. Crider, Nicholson, and Hammack soils formed in a thin mantle of loess and in the underlying limestone residuum. They are clayey in the subsoil.

Some of the soils in the survey area formed entirely in residuum. These soils are mostly on the steeper slopes where loess was not deposited or in areas where erosion removed the loess cap before the present soils developed. Gilpin and Dekalb soils formed in loamy sandstone residuum. Caneyville and Fredonia soils formed in clayey limestone residuum.

Alluvium is parent material that was transported by water from uplands and deposited in valleys. Nolin, Lindside, and Stendal soils formed in alluvium on flood plains and in small depressions on uplands. Elk, Wheeling, and Sciotoville soils formed on alluvial terraces. The alluvium that these soils formed in came from a variety of parent materials and contained a high content of silt. As a result, these soils have loamy textures. Markland and McGary soils, however, formed in alluvium deposited in slack water and have a high content of clay. As a result, these soils have clayey textures.

Plant and Animal Life

Plants and animals greatly influence the formation of soils. Plants add organic matter to the surface layer. Also, their roots transfer or cycle nutrients from the subsoil. Earthworms, ants, crawfish, moles, and other burrowing animals and insects mix the soil and add organic matter. This mixing action affects soil tilth and porosity. Bacteria and fungi convert decaying plant remains into organic matter and thus release plant nutrients.

The native vegetation in the survey area was predominantly hardwood forests. Soils formed under hardwood forests typically are acid and have a thin, dark surface layer resulting from the small amount of organic matter returned to the soil. Also, their subsurface layer typically is leached and their subsoil has a higher content of clay than the soil horizons above or below it.

In some parts of the survey area, the original vegetation was native grasses. Soils formed under grassland vegetation typically have a surface layer that is thicker and darker than that of soils formed under forest vegetation.

People have also influenced soil formation in areas where they have altered the physical properties of the soils by clearing, tilling, and mixing the soils. In places accelerated erosion has removed most of the original surface layer and exposed the subsoil. Soils also have been altered chemically by the use of lime, fertilizer, insecticides, and herbicides.

Relief

Relief, or the position, shape, and slope of the landscape, influences soil formation through its effects on drainage, erosion, soil temperature, and plant cover. Soils that formed on nearly level topography and have poor drainage generally are not so well developed as soils that have good drainage.

As the slope of the landscape increases, poor drainage becomes less of a factor and the effects of erosion are increased. Soils in steep areas are generally not as deep and are less developed than soils in gently sloping areas. Water erosion is increased because of the steeper slope, and often soil material is removed from the surface about as fast as the residuum is formed. The Gilpin, Dekalb, and Caneyville soils on the steeper slopes are not as deep to bedrock as the soils on the more gently sloping landscapes.

The influences of soil temperature and plant cover on soil development are more pronounced on the steeper slopes. These differences are most readily observed when comparing soils on north aspects to soils on south aspects. Soils on south aspects are slightly warmer than those on north aspects, and they erode and weather at a faster rate. Plant cover is also different on north and south aspects. The differences in the amount of moisture and temperature influence the plant species that grow on the differing aspects. The effects of soil temperature and plant cover are evident throughout the survey area.

Time

The time required for a soil to form depends on the other soil-forming factors. Generally, less time is required for a soil to form in a warm, moist climate than in a cool, dry climate. Also, some parent material is more resistant to weathering than others. The age of a soil is determined by the relative degree of profile development rather than the number of years that the soil has been subject to the soil-forming processes.

Soils that have characteristics that are almost identical to those of the parent material are immature. In Breckinridge and Meade Counties, immature soils are on flood plains where the high water table and the fresh deposition of soil material prevent the development of distinct horizons. Melvin and Newark soils are examples. Immature soils also occur on steep side slopes where runoff and geologic erosion prevent profile development. Dekalb soils are an example.

Soils that have well developed profiles are mature soils. They generally are on relatively stable surfaces and are deep to bedrock. Weathering has developed well defined horizons and distinct structural aggregates. Minerals and the finer material have also been translocated into the subsoil. Crider, Hammack, and Zanesville soils are examples of mature soils.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces. Warm aspects are slopes of more than 15 percent that face an azimuth of 135 to 315 degrees. Cool aspects are slopes of more than 15 percent that face an azimuth of 315 to 135 degrees.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	less than 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chert. An impure, very fine grained, siliceous rock commonly associated with limestone or dolomite.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay,

less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

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.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cuesta. A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine earth. The part of the soil that can pass through a number 10 (2 millimeter) U.S. standard sieve.

Fine textured soil. Sandy clay, silty clay, or clay.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

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.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landform. Any physical, recognizable form or feature on the earth's surface that has a characteristic shape and has formed through natural causes. It includes major features such as plains, hills, and valleys.

Landscape (general). All the natural features, such as fields, hills, forests, and areas of water, that distinguish one part of the earth's surface from another part. Generally, that part of land that the eye can comprehend in a single view.

Landscape (geology). The distinct association of landforms, especially as modified by geologic forces, that can be seen in a single view.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Limestone. A sedimentary rock that is more than 50 percent calcium carbonate, mainly in the form of calcite. Limestone generally forms through a combination of organic and inorganic processes and includes soluble and insoluble constituents. Some limestone is fossiliferous.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Mississippian period. The fifth period of the Paleozoic era of geologic time, extending from the end of the Devonian period (about 345 million years ago) to the beginning of the Pennsylvanian period (about 310 million years ago).

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Low	less than 2 percent
Moderate	2 to 4 percent
High	more than 4 percent

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.

Pennsylvanian period. The sixth period of the Paleozoic era of geologic time, extending from the end of the Mississippian period (about 310 million years ago) to the beginning of the Permian period (about 280 million years ago).

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

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.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

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.

Quaternary period. The second period of the Cenozoic era of geologic time, extending from the end of the Tertiary period (about 1 million years ago) to the present.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. 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-sized particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief

kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (sink). 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.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Sloping	6 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 30 percent
Very steep	30 to 90 percent

Classes for complex slopes are as follows:

Nearly level	0 to 2 percent
Undulating	2 to 6 percent
Rolling	6 to 12 percent
Hilly	12 to 20 percent
Steep	20 to 30 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of

the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Tertiary period. The first period of the Cenozoic era of geologic time. It followed the Mesozoic era and preceded the Quarternary period (approximately from 63 million to 1 million years ago).

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.
Water table, apparent.—A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.
Water table, perched.—A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These

changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1964-88 at Rough River Dam, Kentucky)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	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-----	39.5	18.8	29.2	69	-14	14	3.43	1.45	5.10	6	3.0
February----	44.6	22.1	33.4	73	-4	9	3.30	1.52	4.82	6	3.7
March-------	56.2	32.2	44.2	82	10	62	4.18	2.54	5.64	8	1.2
April-------	68.1	42.6	55.4	86	23	195	4.78	2.57	6.72	7	.2
May---------	76.3	50.8	63.6	90	31	426	5.02	2.73	7.03	8	.0
June--------	84.8	59.7	72.3	96	42	669	3.76	1.96	5.32	7	.0
July--------	88.5	63.7	76.1	99	49	809	4.99	3.11	6.67	7	.0
August------	87.1	61.9	74.5	98	47	760	3.73	1.54	5.57	6	.0
September---	80.8	54.8	67.8	94	36	534	3.86	1.90	5.56	6	.0
October-----	68.8	42.0	55.4	86	24	227	2.96	1.30	4.36	6	.0
November----	57.1	34.8	46.0	81	14	50	4.15	2.01	6.00	7	.3
December----	46.4	25.9	36.2	71	3	20	4.24	2.05	6.13	7	.5
Yearly:											
Average---	66.5	42.4	54.5	---	---	---	---	---	---	---	---
Extreme---	---	---	---	100	-14	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,775	48.40	41.51	55.59	81	8.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1964-88 at Rough River Dam, Kentucky)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 30	May 10	May 25
2 years in 10 later than--	Apr. 16	Apr. 26	May 9
5 years in 10 later than--	Mar. 19	Mar. 29	Apr. 8
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 5	Sept. 19	Sept. 1
2 years in 10 earlier than--	Oct. 20	Oct. 5	Sept. 19
5 years in 10 earlier than--	Nov. 18	Nov. 5	Oct. 23

Table 3.--Growing Season

(Recorded in the period 1964-88 at Rough River Dam, Kentucky)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	201	180	154
8 years in 10	209	188	162
5 years in 10	226	203	178
2 years in 10	247	221	196
1 year in 10	365	237	212

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Breckinridge County	Meade County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
AlB2	Alford silt loam, 2 to 6 percent slopes, eroded	40	280	320	0.1
AlC2	Alford silt loam, 6 to 12 percent slopes, eroded	270	285	555	0.1
AlD2	Alford silt loam, 12 to 20 percent slopes, eroded	255	335	590	0.1
BaB2	Baxter very gravelly silt loam, karst, 2 to 6 percent slopes, eroded	20	160	180	*
BaC2	Baxter very gravelly silt loam, karst, 6 to 12 percent slopes, eroded	865	6,655	7,520	1.3
BaD2	Baxter very gravelly silt loam, karst, 12 to 20 percent slopes, eroded	195	14,660	14,855	2.6
BaE2	Baxter very gravelly silt loam, karst, 20 to 30 percent slopes, eroded	0	675	675	0.1
BbC3	Baxter very gravelly silty clay loam, karst, 6 to 12 percent slopes, severely eroded	505	3,050	3,555	0.6
BbD3	Baxter very gravelly silty clay loam, karst, 12 to 20 percent slopes, severely eroded	210	5,900	6,110	1.0
BeC4	Baxter soils, karst, 6 to 12 percent slopes, very severely eroded	0	560	560	0.1
BeD4	Baxter soils, karst, 12 to 20 percent slopes, very severly eroded	0	910	910	0.2
CaC2	Caneyville silt loam, 6 to 12 percent slopes, eroded	795	285	1,080	0.2
CaD2	Caneyville silt loam, 12 to 20 percent slopes, eroded	1,690	2,185	3,875	0.7
CeC3	Caneyville silty clay, 6 to 12 percent slopes, severely eroded	355	170	525	0.1
CeD3	Caneyville silty clay, 12 to 20 percent slopes, severely eroded	710	740	1,450	0.2
CkD	Caneyville-Rock outcrop complex, 12 to 30 percent slopes	14,560	12,840	27,400	4.7
Cn	Chagrin fine sandy loam, occasionally flooded	90	280	370	0.1
Co	Clifty gravelly silt loam, occasionally flooded	2,310	1,035	3,345	0.6
CrB2	Crider silt loam, 2 to 6 percent slopes, eroded	7,590	9,940	17,530	3.0
CrC2	Crider silt loam, 6 to 12 percent slopes, eroded	8,890	12,185	21,075	3.6
CrD2	Crider silt loam, 12 to 20 percent slopes, eroded	1,875	3,415	5,290	0.9
CtC3	Crider silty clay loam, 6 to 12 percent slopes, severely eroded	3,490	1,755	5,245	0.9
CtD3	Crider silty clay loam, 12 to 20 percent slopes, severely eroded	1,235	895	2,130	0.4
Cu	Cuba silt loam, occasionally flooded	3,555	60	3,615	0.6
EkA	Elk silt loam, 0 to 2 percent slopes	310	150	460	0.1
EkB	Elk silt loam, 2 to 6 percent slopes	1,725	1,895	3,620	0.6
EkC2	Elk silt loam, 6 to 12 percent slopes, eroded	430	450	880	0.2
EkD2	Elk silt loam, 12 to 20 percent slopes, eroded	340	180	520	0.1
EkD3	Elk silt loam, 12 to 20 percent slopes, severely eroded	500	380	880	0.2
EkE	Elk silt loam, 20 to 40 percent slopes	935	570	1,505	0.3
FcC2	Fredonia-Crider complex, karst, rocky, 6 to 12 percent slopes, eroded	3,900	5,055	8,955	1.5
FcD2	Fredonia-Crider complex, karst, rocky, 12 to 20 percent slopes, eroded	3,920	2,660	6,580	1.1
FrD3	Fredonia-Crider complex, karst, very rocky, 6 to 20 percent slopes, severely eroded	4,640	2,040	6,680	1.1
GaB2	Gatton silt loam, 2 to 6 percent slopes, eroded	0	240	240	*
GlC2	Gilpin silt loam, 6 to 12 percent slopes, eroded	3,435	980	4,415	0.8
GlC3	Gilpin silt loam, 6 to 12 percent slopes, severely eroded	2,340	255	2,595	0.4
GwF	Gilpin-Dekalb-Rock outcrop complex, 30 to 60 percent slopes	21,100	4,770	25,870	4.4
HaB2	Hammack silt loam, 2 to 6 percent slopes, eroded	10	4,935	4,945	0.8
HbC2	Hammack-Baxter complex, karst, 6 to 12 percent slopes, eroded	155	22,520	22,675	3.9
HbC3	Hammack-Baxter complex, karst, 6 to 12 percent slopes, severely eroded	200	3,155	3,355	0.6
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	60	915	975	0.2
HoC2	Hosmer silt loam, 6 to 12 percent slopes, eroded	275	95	370	0.1
Hu	Huntington silt loam, occasionally flooded	745	1,670	2,415	0.4
LaB	Lakin loamy fine sand, 2 to 6 percent slopes	0	365	365	0.1

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Breckinridge County	Meade County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
LaC	Lakin loamy fine sand, 6 to 15 percent slopes	10	555	565	0.1
Ld	Lindside silt loam, occasionally flooded	1,445	590	2,035	0.3
Ln	Lindside silt loam, depressional, frequently flooded	155	365	520	0.1
MaC3	Markland silty clay loam, 6 to 12 percent slopes, severely eroded	375	295	670	0.1
MaD3	Markland silty clay loam, 12 to 35 percent slopes, severely eroded	620	460	1,080	0.2
Mc	McGary silt loam	185	800	985	0.2
Me	Melvin silt loam, occasionally flooded	210	145	355	0.1
Mf	Melvin silt loam, depressional, frequently flooded	40	80	120	*
Na	Newark silt loam, occasionally flooded	1,180	710	1,890	0.3
Ne	Newark silt loam, depressional, frequently flooded	35	345	380	0.1
NhB2	Nicholson silt loam, 2 to 6 percent slopes, eroded	260	2,725	2,985	0.5
NhC2	Nicholson silt loam, 6 to 12 percent slopes, eroded	400	790	1,190	0.2
NkC4	Nicholson soils, 4 to 12 percent slopes, very severely eroded	0	235	235	*
No	Nolin silt loam, occasionally flooded	6,625	2,440	9,065	1.6
Nv	Nolin silt loam, depressional, frequently flooded	770	2,080	2,850	0.5
PeA	Pekin silt loam, 0 to 2 percent slopes	150	0	150	*
PeB	Pekin silt loam, 2 to 6 percent slopes	275	20	295	*
Pt	Pits, quarries	235	390	625	0.1
RaC2	Riney loam, 6 to 12 percent slopes, eroded	9	765	774	0.1
ReD	Riney-Lily complex, 12 to 20 percent slopes	0	880	880	0.2
ReE	Riney-Lily complex, 20 to 30 percent slopes	0	690	690	0.1
Rf	Robbs silt loam	2,460	865	3,325	0.6
RkF	Rock outcrop-Caneyville complex, 30 to 90 percent slopes	195	2,455	2,650	0.5
RmD	Rock outcrop-Corydon complex, 12 to 30 percent slopes	2,255	415	2,670	0.4
RnC2	Rosine silt loam, 6 to 12 percent slopes, eroded	18,265	805	19,070	3.3
RoC3	Rosine silty clay loam, 6 to 12 percent slopes, severely eroded	8,920	325	9,245	1.6
RsD2	Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, eroded	40,185	7,340	47,525	8.1
RsD3	Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, severely eroded	20,625	2,310	22,935	3.9
RsE	Rosine-Gilpin-Lenberg complex, very rocky, 20 to 30 percent slopes	51,915	14,280	66,195	11.4
SaA	Sadler silt loam, 0 to 2 percent slopes	4,580	935	5,515	0.9
SaB2	Sadler silt loam, 2 to 6 percent slopes, eroded	43,950	4,435	48,385	8.3
ScA	Sciotoville silt loam, 0 to 2 percent slopes	310	125	435	0.1
ScB	Sciotoville silt loam, 2 to 6 percent slopes	1,510	725	2,235	0.4
Sf	Steff silt loam, occasionally flooded	1,395	13	1,408	0.2
St	Stendal silt loam, occasionally flooded	1,800	35	1,835	0.3
VrF	Varilla-Gilpin-Rock outcrop complex, very bouldery, 20 to 65 percent slopes	7,095	95	7,190	1.2
W	Water	13,414	11,424	24,838	4.3
We	Weinbach silt loam	730	315	1,045	0.2
WtF	Westmoreland-Caneyville-Rock outcrop complex, 30 to 80 percent slopes	0	1,960	1,960	0.3
WxB	Wheeling fine sandy loam, 2 to 6 percent slopes	110	1,005	1,115	0.2
WxC2	Wheeling fine sandy loam, 6 to 12 percent slopes, eroded	55	355	410	0.1
Ya	Yeager loamy sand, occasionally flooded	0	215	215	*
ZaB2	Zanesville silt loam, 2 to 6 percent slopes, eroded	16,825	3,100	19,925	3.4
ZaC2	Zanesville silt loam, 6 to 12 percent slopes, eroded	22,910	4,375	27,285	4.7
ZnC3	Zanesville silty clay loam, 6 to 12 percent slopes, severely eroded	7,865	1,750	9,615	1.7
	Total	374,873	207,552	582,425	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
		Bu	Lbs	Bu	Bu	Ton	Ton	AUM*
AlB2---------- Alford	IIe	140	3,000	45	50	5.5	4.5	9.0
AlC2---------- Alford	IIIe	120	2,800	40	45	5.0	4.0	8.0
AlD2---------- Alford	IVe	105	---	---	30	4.5	3.5	7.5
BaB2---------- Baxter	IIe	110	2,700	35	45	5.0	4.5	9.0
BaC2---------- Baxter	IIIe	80	2,500	30	35	4.5	4.0	8.0
BaD2---------- Baxter	IVe	70	1,500	25	30	3.5	3.0	6.5
BaE2---------- Baxter	VIe	---	---	---	---	---	---	4.0
BbC3---------- Baxter	IVe	75	1,600	25	30	4.0	3.5	7.0
BbD3---------- Baxter	VIe	---	---	---	---	3.0	3.0	6.0
BeC4---------- Baxter	VIe	---	---	---	---	---	---	3.0
BeD4---------- Baxter	VIIe	---	---	---	---	---	---	---
CaC2---------- Caneyville	IIIe	70	2,000	25	---	4.0	3.5	7.0
CaD2---------- Caneyville	VIe	---	---	---	---	---	2.5	5.0
CeC3---------- Caneyville	IVe	---	---	---	---	---	2.5	5.5
CeD3---------- Caneyville	VIe	---	---	---	---	---	---	4.0
CkD**:								
Caneyville-----	VIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
Cn---------- Chagrin	IIw	135	---	45	50	5.5	5.0	10.0
Co---------- Clifty	IIs	120	2,500	35	35	5.0	4.5	9.0
CrB2---------- Crider	IIe	140	3,200	50	50	5.5	5.0	10.0

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
		Bu	Lbs	Bu	Bu	Ton	Ton	AUM*
CrC2---- Crider	IIIe	115	2,900	40	45	5.0	4.5	9.0
CrD2---- Crider	IVe	90	2,400	30	35	4.5	4.0	7.5
CtC3---- Crider	IVe	85	2,400	30	30	4.5	4.0	8.0
CtD3---- Crider	VIe	---	---	---	---	4.0	3.5	7.0
Cu---- Cuba	IIw	135	---	45	50	5.5	4.5	9.0
EkA---- Elk	I	145	3,200	50	45	5.5	4.5	9.0
EkB---- Elk	IIe	140	3,200	50	50	5.5	4.5	9.0
EkC2---- Elk	IIIe	120	2,900	40	45	5.0	4.0	8.0
EkD2---- Elk	IVe	90	---	---	---	---	3.5	7.0
EkD3---- Elk	VIe	---	---	---	---	---	3.0	6.5
EkE---- Elk	VIe	---	---	---	---	---	---	5.5
FcC2**---- Fredonia-Crider	VIs	---	---	---	---	---	4.5	8.5
FcD2**---- Fredonia-Crider	VIs	---	---	---	---	---	4.0	7.0
FrD3**---- Fredonia-Crider	VIIs	---	---	---	---	---	---	---
GaB2---- Gatton	IIe	115	2,800	35	35	---	3.5	6.5
GlC2---- Gilpin	IIIe	85	---	25	30	---	3.0	6.5
GlC3---- Gilpin	IVe	80	---	---	25	---	2.5	6.0
GwF**:								
Gilpin-Dekalb--	VIIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
HaB2---- Hammack	IIe	130	2,800	35	50	5.5	5.0	10.0
HbC2**---- Hammack-Baxter	IIIe	105	2,220	30	40	5.0	4.5	9.0

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
		Bu	Lbs	Bu	Bu	Ton	Ton	AUM*
HbC3**---------- Hammack-Baxter	IVe	80	1,700	25	30	4.5	3.5	7.5
HoB2---------- Hosmer	IIe	125	2,550	45	45	---	3.5	7.0
HoC2---------- Hosmer	IIIe	110	2,150	30	35	---	3.5	6.5
Hu---------- Huntington	IIw	150	3,200	50	55	5.5	5.0	9.0
LaB---------- Lakin	IIIs	80	---	25	30	3.5	2.5	5.0
LaC---------- Lakin	IVs	70	---	---	25	3.0	2.0	4.0
Ld---------- Lindside	IIw	135	2,800	50	50	4.5	4.0	9.0
Ln---------- Lindside	IIw	130	---	45	40	4.0	4.0	8.0
MaC3---------- Markland	VIe	---	---	---	---	---	---	4.0
MaD3---------- Markland	VIIe	---	---	---	---	---	---	---
Mc---------- McGary	IIIw	85	---	25	---	---	3.0	6.0
Me---------- Melvin	IIIw	90	---	35	---	---	3.5	7.0
Mf---------- Melvin	IIIw	80	---	30	---	---	3.0	6.5
Na---------- Newark	IIw	125	2,500	45	45	---	4.5	8.5
Ne---------- Newark	IIw	115	---	40	---	---	4.0	8.0
NhB2---------- Nicholson	IIe	125	2,800	45	45	---	3.5	7.0
NhC2---------- Nicholson	IIIe	110	2,200	30	35	---	3.0	6.5
NkC4---------- Nicholson	VIe	---	---	---	---	---	---	3.0
No---------- Nolin	IIw	140	3,000	50	50	5.5	4.5	9.0
Nv---------- Nolin	IIw	130	---	40	45	4.5	4.0	8.5

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
		Bu	Lbs	Bu	Bu	Ton	Ton	AUM*
PeA---------- Pekin	IIw	110	---	40	40	---	3.0	6.5
PeB---------- Pekin	IIe	115	---	45	45	---	3.0	7.0
Pt**---------- Pits, quarries	VIIIs	---	---	---	---	---	---	---
RaC2---------- Riney	IIIe	85	2,600	30	40	4.5	3.0	6.0
ReD**---------- Riney-Lily	IVe	75	---	---	30	3.5	2.5	5.0
ReE**---------- Riney-Lily	VIe	---	---	---	---	---	---	4.5
Rf---------- Robbs	IIw	110	---	30	30	---	3.5	7.0
RkF**:								
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
Caneyville-----	VIIe	---	---	---	---	---	---	---
RmD**:								
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
Corydon--------	VIIe	---	---	---	---	---	---	---
RnC2---------- Rosine	IIIe	110	2,800	35	40	4.5	4.0	8.0
RoC3---------- Rosine	IVe	85	2,100	25	30	4.0	3.5	7.0
RsD2**---------- Rosine-Gilpin- Lenberg	IVe	75	---	---	---	---	3.0	6.0
RsD3**---------- Rosine-Gilpin- Lenberg	VIe	---	---	---	---	---	---	5.0
RsE**---------- Rosine-Gilpin- Lenberg	VIe	---	---	---	---	---	---	4.0
SaA---------- Sadler	IIw	115	2,350	35	40	---	3.5	7.0
SaB2---------- Sadler	IIe	120	2,700	45	45	---	3.5	7.0
ScA---------- Sciotoville	IIw	110	---	40	40	---	3.5	6.5
ScB---------- Sciotoville	IIe	115	---	45	45	---	3.5	7.0
Sf---------- Steff	IIw	130	2,900	50	50	4.5	4.5	9.0

See footnotes at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
		Bu	Lbs	Bu	Bu	Ton	Ton	AUM*
St---------- Stendal	IIw	120	---	45	---	---	4.0	8.5
VrF**:								
Varilla--------	VIIe	---	---	---	---	---	---	---
Gilpin---------	VIIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
W** Water								
We---------- Weinbach	IIw	110	---	35	35	---	3.5	7.0
WtF**:								
Westmoreland---	VIIe	---	---	---	---	---	---	---
Caneyville-----	VIIe	---	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---	---
WxB---------- Wheeling	IIe	135	3,000	45	50	5.0	4.5	9.0
WxC2---------- Wheeling	IIIe	120	2,600	40	40	4.5	4.0	8.0
Ya---------- Yeager	IIw	80	---	---	---	---	3.0	6.0
ZaB2---------- Zanesville	IIe	125	2,800	35	45	---	3.5	7.0
ZaC2---------- Zanesville	IIIe	110	2,300	30	35	---	3.5	6.5
ZnC3---------- Zanesville	IVe	60	2,000	20	25	---	3.0	5.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 6.--Capability Classes and Subclasses

(Miscellaneous areas are excluded. Dashes indicate no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I:				
Breckinridge County	310	---	---	---
Meade County	150	---	---	---
II:				
Breckinridge County	100,710	72,375	26,025	2,310
Meade County	42,453	30,375	11,043	1,035
III:				
Breckinridge County	57,189	56,754	435	---
Meade County	51,935	50,545	1,025	365
IV:				
Breckinridge County	66,535	66,525	---	10
Meade County	37,825	37,270	---	555
V:				
Breckinridge County	---	---	---	---
Meade County	---	---	---	---
VI:				
Breckinridge County	96,555	88,735	---	7,820
Meade County	46,480	38,765	---	7,715
VII:				
Breckinridge County	30,121	25,481	---	4,640
Meade County	10,833	8,793	---	2,040
VIII:				
Breckinridge County	10,039	---	---	10,039
Meade County	6,452	---	---	6,452

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
AlB2, AlC2, AlD2---- Alford	Slight	Slight	Slight	Severe	White oak	90	72	Eastern white pine, white oak, black walnut, yellow-poplar, white ash.
					Yellow-poplar	98	104	
					Sweetgum	76	132	
BaB2, BaC2---- Baxter	Slight	Slight	Slight	Severe	Black oak	81	63	Yellow-poplar, eastern white pine, shortleaf pine, white ash, white oak, northern red oak, loblolly pine.
					White oak	74	56	
					Northern red oak	---	---	
					Yellow-poplar	92	93	
					Hickory	---	---	
					Sassafras	---	---	
					Sugar maple	---	---	
					Southern red oak	71	53	
					Virginia pine	64	98	
BaD2, BaE2---- Baxter	Moderate	Moderate	Slight	Severe	Black oak	81	63	Yellow-poplar, eastern white pine, shortleaf pine, white ash, white oak, northern red oak, loblolly pine.
					White oak	74	56	
					Northern red oak	---	---	
					Yellow-poplar	92	93	
					Hickory	---	---	
					Sassafras	---	---	
					Sugar maple	---	---	
					Southern red oak	71	53	
					Virginia pine	64	98	
BbC3---- Baxter	Slight	Moderate	Moderate	Severe	Black oak	70	52	Eastern white pine, white ash, loblolly pine, white oak.
					White oak	65	47	
					Hickory	---	---	
					Southern red oak	---	---	
					Blackgum	---	---	
BbD3---- Baxter	Moderate	Moderate	Moderate	Severe	Black oak	70	52	Eastern white pine, white ash, loblolly pine, white oak.
					White oak	65	47	
					Hickory	---	---	
					Southern red oak	---	---	
					Blackgum	---	---	
BeC4---- Baxter	Slight	Moderate	Moderate	Severe	Black oak	70	52	Eastern white pine, white ash, loblolly pine, white oak.
					White oak	65	47	
					Hickory	---	---	
					Southern red oak	---	---	
					Blackgum	---	---	
BeD4---- Baxter	Moderate	Moderate	Moderate	Severe	Black oak	70	52	Eastern white pine, white ash, loblolly pine, white oak.
					White oak	65	47	
					Hickory	---	---	
					Southern red oak	---	---	
					Blackgum	---	---	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
CaC2---------- Caneyville	Moderate	Moderate	Slight	Severe	Black oak----------	67	49	Virginia pine, eastern white pine, loblolly pine.
					White oak----------	58	41	
					Sugar maple---------	---	---	
					Hickory------------	---	---	
					Eastern redcedar----	36	38	
					Chinkapin oak-------	44	29	
					Scarlet oak---------	52	36	
CaD2---------- Caneyville (cool aspect)	Severe	Moderate	Slight	Severe	Black oak----------	71	53	White oak, yellow-poplar, white ash, eastern white pine, loblolly pine.
					White oak----------	64	47	
					Sugar maple---------	---	---	
					Hickory------------	---	---	
					White ash----------	75	---	
					Eastern redcedar----	46	54	
					Yellow-poplar-------	90	90	
CaD2---------- Caneyville (warm aspect)	Severe	Moderate	Moderate	Severe	Black oak----------	67	49	Virginia pine, eastern redcedar, loblolly pine.
					White oak----------	58	41	
					Sugar maple---------	---	---	
					Hickory------------	---	---	
					Eastern redcedar----	36	38	
					Chinkapin oak-------	44	29	
					Scarlet oak---------	52	36	
CeC3---------- Caneyville	Moderate	Moderate	Moderate	Moderate	Black oak----------	60	43	Virginia pine, eastern redcedar.
					White oak----------	50	34	
					Hickory------------	---	---	
					Eastern redcedar----	30	32	
CeD3---------- Caneyville (cool aspect)	Severe	Moderate	Moderate	Moderate	Black oak----------	60	43	White ash, white oak, Virginia pine, eastern white pine, loblolly pine.
					White oak----------	55	38	
					Hickory------------	---	---	
					White ash----------	65	---	
					Sugar maple---------	---	---	
					Virginia pine-------	---	---	
					Yellow-poplar-------	---	---	
CeD3---------- Caneyville (warm aspect)	Severe	Moderate	Moderate	Moderate	Black oak----------	60	43	Virginia pine, eastern redcedar.
					White oak----------	50	34	
					Hickory------------	---	---	
					Eastern redcedar----	30	32	
CkD**: Caneyville (cool aspect)-	Severe	Moderate	Slight	Moderate	Black oak----------	71	53	White oak, yellow-poplar, white ash, eastern white pine, loblolly pine.
					White oak----------	64	47	
					Sugar maple---------	---	---	
					Hickory------------	---	---	
					White ash----------	75	---	
					Eastern redcedar----	46	54	
					Yellow-poplar-------	90	90	
Rock outcrop.								

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
CkD**:								
Caneyville (warm aspect)-	Severe	Moderate	Moderate	Slight	Black oak	67	49	Virginia pine,
					White oak	58	41	eastern
					Sugar maple	---	---	redcedar,
					Hickory	---	---	loblolly pine.
					Eastern redcedar	36	38	
					Chinkapin oak	44	29	
					Scarlet oak	52	36	
Rock outcrop.								
Cn	Slight	Slight	Moderate	Severe	Northern red oak	75	57	Eastern white
Chagrin					Yellow-poplar	85	81	pine, black
					Sugar maple	---	---	walnut,
					White oak	---	---	yellow-poplar,
					Black cherry	---	---	white ash,
					White ash	---	---	northern red
					Black walnut	---	---	oak, white
								oak.
Co	Slight	Slight	Moderate	Severe	Shortleaf pine	76	122	Sweetgum, white
Clifty					Yellow-poplar	72	57	ash, shortleaf
					Virginia pine	---	---	pine, eastern
					White oak	65	47	white pine,
					Northern red oak	---	---	northern red
					American beech	---	---	oak, white
					American sycamore	---	---	oak, loblolly
					Black walnut	---	---	pine.
					Red maple	---	---	
CrB2, CrC2	Slight	Slight	Slight	Severe	Yellow-poplar	97	102	Eastern white
Crider					Sugar maple	---	---	pine, yellow-
					Black oak	84	66	poplar, black
					White ash	---	---	walnut,
					Black walnut	80	---	loblolly pine,
					White oak	72	54	white ash,
					Hickory	---	---	northern red
					Northern red oak	84	66	oak, white
								oak, shortleaf
								pine.
CrD2	Moderate	Moderate	Slight	Severe	Yellow-poplar	97	102	Eastern white
Crider					Sugar maple	---	---	pine, yellow-
					Black oak	84	66	poplar, black
					White ash	---	---	walnut,
					Black walnut	80	---	loblolly pine,
					White oak	72	54	white ash,
					Hickory	---	---	northern red
					Northern red oak	84	66	oak, white
								oak, shortleaf
								pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
CtC3---------- Crider	Slight	Slight	Slight	Severe	Yellow-poplar--------- Sugar maple--------- Black oak---------- White ash---------- Black walnut-------- White oak---------- Hickory---------- Northern red oak----	97 --- 84 --- 80 72 --- 84	102 --- 66 --- --- 54 --- 66	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash, northern red oak, white oak, shortleaf pine.
CtD3---------- Crider	Moderate	Moderate	Slight	Severe	Yellow-poplar--------- Sugar maple--------- Black oak---------- White ash---------- Black walnut-------- White oak---------- Hickory---------- Northern red oak----	97 --- 84 --- 80 72 --- 84	102 --- 66 --- --- 54 --- 66	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash, northern red oak, white oak, shortleaf pine.
Cu---------- Cuba	Slight	Slight	Slight	Severe	Yellow-poplar--------- Sweetgum---------- Virginia pine------- American elm-------- Black walnut---------	104 --- 77 --- ---	114 --- 118 --- ---	Yellow-poplar, eastern white pine, black walnut, white ash.
EkA, EkB, EkC2-- Elk	Slight	Slight	Slight	Severe	Yellow-poplar--------- Cherrybark oak------ Pin oak---------- Hackberry---------- Red maple---------- American sycamore--- Black walnut---------	91 95 96 --- --- --- ---	92 133 93 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white oak, cherrybark oak, white ash, shortleaf pine.
EkD2, EkD3, EkE- Elk	Moderate	Moderate	Slight	Severe	Yellow-poplar--------- Cherrybark oak------ Pin oak---------- Hackberry---------- Red maple---------- American sycamore--- Black walnut---------	91 95 96 --- --- --- ---	92 133 93 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white oak, cherrybark oak, white ash, shortleaf pine.
FcC2**: Fredonia-------	Slight	Moderate	Slight	Severe	Black oak---------- Eastern redcedar---- White oak----------	70 --- 65	52 --- 47	White oak, eastern white pine, white ash.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
FcC2**:								
Crider	Slight	Slight	Slight	Severe	Yellow-poplar	97	102	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash, northern red oak, white oak, shortleaf pine.
					Sugar maple	---	---	
					Black oak	84	66	
					White ash	---	---	
					Black walnut	80	---	
					White oak	72	54	
					Hickory	---	---	
					Northern red oak	84	66	
FcD2**:								
Fredonia	Moderate	Moderate	Slight	Severe	Black oak	70	52	White oak, eastern white pine, white ash.
					Eastern redcedar	50	---	
					White oak	65	47	
Crider	Moderate	Moderate	Slight	Severe	Yellow-poplar	97	102	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash, northern red oak, white oak, shortleaf pine.
					Sugar maple	---	---	
					Black oak	84	66	
					White ash	---	---	
					Black walnut	80	---	
					White oak	72	54	
					Hickory	---	---	
					Northern red oak	84	66	
FrD3**:								
Fredonia	Severe	Moderate	Slight	Moderate	Black oak	60	43	White ash, Virginia pine, eastern redcedar.
					Eastern redcedar	---	---	
					White oak	55	38	
Crider	Moderate	Moderate	Slight	Severe	Yellow-poplar	97	102	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash, northern red oak, white oak, shortleaf pine.
					Sugar maple	---	---	
					Black oak	84	66	
					White ash	---	---	
					Black walnut	80	---	
					White oak	72	54	
					Hickory	---	---	
					Northern red oak	84	66	
GaB2 Gatton	Slight	Slight	Slight	Severe	Yellow-poplar	85	81	Yellow-poplar, loblolly pine, eastern white pine, shortleaf pine, white oak.
					White oak	70	52	
					Red maple	---	---	
					Chinkapin oak	---	---	
					Black oak	---	---	
					Hickory	---	---	
GlC2, GlC3 Gilpin	Slight	Slight	Slight	Moderate	Northern red oak	77	59	Shortleaf pine, loblolly pine, eastern white pine, white oak, yellow-poplar.
					Yellow-poplar	99	90	
					Shortleaf pine	70	110	
					Virginia pine	75	115	
					White oak	73	55	
					Scarlet oak	77	59	
					Chestnut oak	76	58	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
GwF**:								
Gilpin (cool aspect)	Severe	Severe	Slight	Moderate	Black oak	79	61	Shortleaf pine,
					Yellow-poplar	90	90	loblolly pine,
					White oak	73	55	eastern white
					Scarlet oak	77	59	pine, northern
					Chestnut oak	76	58	red oak, white
					Shortleaf pine	70	110	oak,
								yellow-poplar.
Dekalb (cool aspect)	Moderate	Severe	Slight	Moderate	Black oak	73	55	Eastern white
					White oak	73	55	pine, white
					Chestnut oak	75	57	oak, loblolly pine,
					Yellow-poplar	90	90	yellow-poplar,
					Shortleaf pine	72	114	shortleaf pine.
Rock outcrop.								
GwF**:								
Gilpin (warm aspect)	Severe	Severe	Moderate	Moderate	Black oak	70	52	Loblolly pine,
					Yellow-poplar	87	84	shortleaf pine,
					White oak	65	47	white oak.
					Scarlet oak	72	54	
					Chestnut oak	68	50	
					Shortleaf pine	61	90	
					Virginia pine	66	102	
Dekalb (warm aspect)	Moderate	Severe	Moderate	Moderate	Black oak	69	51	Loblolly pine,
					Shortleaf pine	62	92	white oak,
					Chestnut oak	63	46	shortleaf
					Scarlet oak	66	48	pine.
					White oak	66	48	
					Virginia pine	65	100	
Rock outcrop.								
HaB2	Slight	Slight	Slight	Severe	Yellow-poplar	88	86	Yellow-poplar,
Hammack					Black oak	80	62	shortleaf
					Hickory	---	---	pine, loblolly
					Southern red oak	80	62	pine, northern
					Sugar maple	---	---	red oak, eastern
								white pine.
HbC2**:								
Hammack	Slight	Slight	Slight	Severe	Yellow-poplar	88	86	Yellow-poplar,
					Black oak	80	62	shortleaf
					Hickory	---	---	pine, loblolly
					Southern red oak	80	62	pine, northern
					Sugar maple	---	---	red oak, eastern
								white pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
HbC2**:								
Baxter	Slight	Slight	Slight	Severe	Black oak	81	63	Yellow-poplar,
					White oak	74	56	eastern white
					Northern red oak	---	---	pine,
					Yellow-poplar	92	93	shortleaf
					Hickory	---	---	pine, white
					Sassafras	---	---	ash, white
					Sugar maple	---	---	oak, northern
					Southern red oak	71	53	red oak,
								loblolly pine.
HbC3**:								
Hammack	Slight	Slight	Slight	Severe	Southern red oak	70	52	Eastern white
					Black oak	70	52	pine,
					Yellow-poplar	80	71	shortleaf
					Hickory	---	---	pine, loblolly
					Sugar maple	---	---	pine, white
								oak.
Baxter	Slight	Moderate	Moderate	Moderate	Black oak	70	52	Eastern white
					White oak	65	47	pine, white
					Hickory	---	---	ash, loblolly
					Southern red oak	65	47	pine, northern
					Blackgum	---	---	red oak, white
								oak.
HoB2, HoC2 Hosmer	Slight	Slight	Slight	Severe	White oak	67	49	Eastern white
					Yellow-poplar	93	95	pine, shortleaf
					Virginia pine	---	---	pine, yellow-
					Sugar maple	---	---	poplar, white
					White ash	---	---	ash.
Hu Huntington	Slight	Slight	Slight	Severe	Yellow-poplar	95	98	Yellow-poplar,
					Northern red oak	---	---	black walnut,
					White oak	---	---	eastern white
					Black walnut	70	---	pine, loblolly
					Virginia pine	73	113	pine, northern red
								oak.
LaB, LaC Lakin	Slight	Moderate	Slight	Moderate	Northern red oak	60	43	Eastern white
					Virginia pine	60	91	pine, shortleaf
					Chestnut oak	60	43	pine.
					Black oak	60	43	
Ld, Ln Lindside	Slight	Slight	Moderate	Severe	Northern red oak	86	68	Northern red
					Yellow-poplar	95	98	oak, yellow-
					Black walnut	---	---	poplar, black
					White ash	85	---	walnut, white
					White oak	85	67	ash, white
					Red maple	---	---	oak, eastern
								white pine,
								shortleaf pine.
MaC3 Markland	Slight	Slight	Moderate	Moderate	White oak	65	47	Eastern white
					Post oak	53	37	pine, yellow-
					Black oak	65	47	poplar, white
					Yellow-poplar	97	102	ash, white oak,
					Hickory	---	---	loblolly pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
MaD3---------- Markland	Moderate	Moderate	Moderate	Moderate	White oak----------	65	47	Eastern white pine, yellow-poplar, white ash, loblolly pine, white oak.
					Post oak----------	53	37	
					Black oak----------	65	47	
					Yellow-poplar-------	97	102	
					Hickory----------	---	---	
Mc---------- McGary	Slight	Moderate	Slight	Severe	Pin oak----------	80	74	Eastern white pine, baldcypress, green ash, pin oak, American sycamore.
					Post oak----------	66	48	
					Hickory----------	---	---	
					Sweetgum----------	---	---	
					Red maple----------	---	---	
					Hackberry----------	---	---	
					Green ash----------	---	---	
					White oak----------	64	47	
Me, Mf---------- Melvin	Slight	Moderate	Moderate	Severe	Pin oak----------	98	95	Pin oak, American sycamore, green ash, sweetgum, loblolly pine, eastern cottonwood, willow oak.
					Eastern cottonwood--	101	130	
					Sweetgum----------	89	103	
					Green ash----------	---	---	
					Hackberry----------	---	---	
					Hickory----------	---	---	
					Red maple----------	---	---	
					American elm--------	---	---	
					Cherrybark oak------	91	119	
Na, Ne---------- Newark	Slight	Moderate	Moderate	Severe	Pin oak----------	100	98	Eastern cottonwood, sweetgum, American sycamore, green ash.
					Eastern cottonwood--	94	113	
					Sweetgum----------	85	93	
					Green ash----------	---	---	
					Cherrybark oak------	---	---	
					Shumard oak---------	---	---	
					Overcup oak---------	---	---	
NhB2, NhC2------ Nicholson	Moderate	Slight	Slight	Severe	Black oak----------	77	59	White oak, northern red oak, sweetgum, yellow-poplar, eastern white pine, loblolly pine.
					White oak----------	72	54	
					Hickory----------	---	---	
					Sweetgum----------	85	93	
					Yellow-poplar-------	107	119	
					Northern red oak----	79	61	
NkC4---------- Nicholson	Moderate	Slight	Moderate	Severe	Black oak----------	70	52	White ash, white oak, northern red oak, yellow-poplar, loblolly pine, eastern white pine.
					White ash----------	---	---	
					Sugar maple---------	---	---	
					White oak----------	---	---	
					Hickory----------	---	---	
					Southern red oak----	---	---	
No---------- Nolin	Slight	Slight	Slight	Severe	Yellow-poplar-------	107	119	Yellow-poplar, eastern white pine, eastern cottonwood, white ash, cherrybark oak, sweetgum, black walnut.
					Sweetgum----------	92	112	
					Cherrybark oak------	97	140	
					Eastern cottonwood--	---	---	
					Black walnut--------	---	---	
					American sycamore---	---	---	
					River birch---------	---	---	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
Nv Nolin	Slight	Slight	Moderate	Severe	Sweetgum Cherrybark oak Eastern cottonwood River birch Black willow American sycamore	92 97 --- --- --- ---	112 140 --- --- --- ---	Eastern cottonwood, green ash, cherrybark oak, sweetgum, pin oak.
PeA, PeB Pekin	Slight	Slight	Slight	Severe	White oak Yellow-poplar Virginia pine Sugar maple White ash	70 103 75 75 88	52 112 115 --- ---	Yellow-poplar, eastern white pine, shortleaf pine, white ash.
RaC2 Riney	Slight	Moderate	Slight	Severe	Yellow-poplar White oak Red maple Chinkapin oak Black oak	96 78 --- 74 80	100 60 --- 56 62	Yellow-poplar, white ash, loblolly pine, black walnut, eastern white pine.
ReD**, ReE**: Riney (cool aspect)	Moderate	Moderate	Slight	Severe	Yellow-poplar White oak Red maple Chinkapin oak Black oak	96 78 --- 74 80	100 60 --- 56 62	Yellow-poplar, white ash, black walnut, white oak, eastern white pine.
Lily (cool aspect)	Moderate	Moderate	Slight	Moderate	Shortleaf pine Virginia pine Black oak White oak Chestnut oak Yellow-poplar Northern red oak Scarlet oak	63 72 80 69 73 107 81 73	95 112 62 51 55 119 63 55	Shortleaf pine, white oak, eastern white pine, yellow-poplar, northern red oak, white oak.
ReD, ReE**: Riney (warm aspect)	Moderate	Moderate	Moderate	Severe	White oak Red maple Chinkapin oak Black oak	78 --- 74 80	60 --- 56 62	White oak, loblolly pine, shortleaf pine, eastern white pine.
Lily (warm aspect)	Moderate	Moderate	Moderate	Moderate	Shortleaf pine Virginia pine Scarlet oak White oak	57 71 66 67	82 110 43 49	Shortleaf pine, white oak.
Rf Robbs	Slight	Moderate	Slight	Severe	White oak Yellow-poplar Southern red oak Pin oak Black oak Red maple Sweetgum	73 94 --- 85 77 --- ---	55 97 --- 80 59 --- ---	Eastern white pine, yellow-poplar, green ash, sweetgum, loblolly pine, shortleaf pine, American sycamore.
RkF**: Rock outcrop.								

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
RkF**:								
Caneyville (cool aspect)	Severe	Severe	Slight	Moderate	Black oak	71	53	White oak,
					White oak	64	47	yellow-poplar,
					Sugar maple	---	---	white ash,
					Hickory	---	---	eastern white
					White ash	75	---	pine, northern
					Eastern redcedar	46	54	red oak.
					Yellow-poplar	90	90	
RkF**:								
Rock outcrop.								
Caneyville (warm aspect)	Severe	Severe	Moderate	Moderate	Black oak	67	49	Virginia pine,
					White oak	58	41	eastern
					Sugar maple	---	---	redcedar,
					Hickory	---	---	white oak.
					Eastern redcedar	36	38	
					Chinkapin oak	44	29	
					Scarlet oak	52	36	
RmD**:								
Rock outcrop.								
Corydon	Moderate	Moderate	Moderate	Moderate	Northern red oak	73	55	Yellow-poplar,
					White oak	70	52	eastern white pine,
					Yellow-poplar	85	81	northern red oak,
					Sugar maple	---	---	white oak.
					Chinkapin oak	66	48	
RnC2, RoC3	Slight	Slight	Slight	Severe	Yellow-poplar	90	90	Yellow-poplar,
Rosine					White oak	80	62	white ash,
					Black oak	80	62	white oak,
					Pignut hickory	---	---	northern red
					Black walnut	---	---	oak, eastern
					White ash	---	---	white pine,
					Black cherry	---	---	shortleaf
					American beech	---	---	pine.
RsD2**:								
Rosine (cool aspect)	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	90	Yellow-poplar,
					White oak	80	62	white ash,
					Black oak	80	62	white oak,
					Pignut hickory	---	---	northern red
					Black walnut	---	---	oak, eastern
					White ash	---	---	white pine,
					Black cherry	---	---	shortleaf
					American beech	---	---	pine.
Gilpin (cool aspect)	Moderate	Moderate	Slight	Moderate	Northern red oak	80	62	White oak,
					Yellow-poplar	95	98	eastern white pine, black cherry, yellow-poplar.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
RsD2**:								
Lenberg (cool aspect)	Moderate	Moderate	Slight	Slight	Virginia pine	61	93	Shortleaf pine,
					White oak	57	40	Virginia pine,
					Hickory	---	---	loblolly pine,
					Chestnut oak	60	43	white oak.
					Scarlet oak	58	41	
					Black oak	60	43	
					Post oak	46	31	
RsD2**:								
Rosie (warm aspect)	Moderate	Moderate	Moderate	Moderate	Black oak	70	52	White oak,
					White oak	68	50	shortleaf
					Scarlet oak	---	---	pine.
					Pignut hickory	---	---	
Gilpin (warm aspect)	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	52	Loblolly pine,
					Black oak	79	61	shortleaf pine,
					White oak	73	55	white oak.
					Chestnut oak	76	58	
					Scarlet oak	77	59	
Lenberg (warm aspect)	Moderate	Moderate	Slight	Slight	Virginia pine	61	93	Shortleaf pine,
					White oak	57	40	Virginia pine,
					Hickory	---	---	loblolly pine,
					Chestnut oak	60	43	white oak.
					Scarlet oak	58	41	
					Black oak	60	43	
					Post oak	46	31	
RsD3**:								
Rosine (cool aspect)	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	90	Yellow-poplar,
					White oak	80	62	white ash,
					Black oak	80	62	white oak,
					Pignut hickory	---	---	northern red
					Black walnut	---	---	oak, eastern
					White ash	---	---	white pine,
					Black cherry	---	---	shortleaf
					American beech	---	---	pine.
Gilpin (cool aspect)	Moderate	Moderate	Slight	Moderate	Northern red oak	80	62	White oak,
					Yellow-poplar	95	98	eastern white
								pine, black
								cherry,
								yellow-poplar.
Lenberg (cool aspect)	Moderate	Moderate	Slight	Slight	Virginia pine	61	93	Shortleaf pine,
					White oak	57	40	Virginia pine,
					Hickory	---	---	loblolly pine,
					Chestnut oak	60	43	white oak.
					Scarlet oak	58	41	
					Black oak	60	43	
					Post oak	46	31	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
RsD3**:								
Rosine (warm aspect)	Moderate	Moderate	Moderate	Moderate	Black oak	70	52	White oak, shortleaf pine.
					White oak	68	50	
					Scarlet oak	---	---	
					Pignut hickory	---	---	
Gilpin (warm aspect)	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	52	Loblolly pine, shortleaf pine, white oak.
					Black oak	79	61	
					White oak	73	55	
					Chestnut oak	76	58	
					Scarlet oak	77	59	
Lenberg (warm aspect)	Moderate	Moderate	Slight	Slight	Virginia pine	61	93	Shortleaf pine, Virginia pine, loblolly pine, white oak.
					White oak	58	41	
					Hickory	---	---	
					Chestnut oak	56	39	
					Scarlet oak	62	45	
					Black oak	60	43	
					Post oak	46	31	
RsE**:								
Rosine (cool aspect)	Moderate	Moderate	Slight	Moderate	Yellow-poplar	90	90	Yellow-poplar, white ash, white oak, northern red oak, eastern white pine, shortleaf pine.
					White oak	80	62	
					Black oak	80	62	
					Pignut hickory	---	---	
					Black walnut	---	---	
					White ash	---	---	
					Black cherry	---	---	
					American beech	---	---	
Gilpin (cool aspect)	Moderate	Moderate	Slight	Moderate	Northern red oak	77	59	Shortleaf pine, loblolly pine, eastern white pine, northern red oak, yellow-poplar, white oak.
					Yellow-poplar	90	90	
					Black oak	79	61	
					White oak	73	55	
					Chestnut oak	76	58	
					Scarlet oak	77	59	
Lenberg (cool aspect)	Severe	Severe	Slight	Moderate	Virginia pine	61	93	Shortleaf pine, loblolly pine, white oak.
					White oak	58	41	
					Hickory	---	---	
					Chestnut oak	56	39	
					Scarlet oak	62	45	
					Black oak	60	43	
					Post oak	46	31	
RsE**:								
Rosine (warm aspect)	Moderate	Moderate	Moderate	Moderate	Black oak	70	52	White oak, shortleaf pine, loblolly pine.
					White oak	65	47	
					Scarlet oak	---	---	
					Pignut hickory	---	---	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
RsE**:								
Gilpin (warm aspect)	Moderate	Moderate	Moderate	Moderate	Northern red oak	69	51	Loblolly pine,
					Black oak	70	52	shortleaf pine,
					White oak	65	47	white oak.
					Scarlet oak	72	54	
					Chestnut oak	68	50	
					Virginia pine	66	102	
Lenberg (warm aspect)	Severe	Severe	Slight	Moderate	Virginia pine	61	93	Shortleaf pine,
					White oak	58	41	Virginia pine,
					Hickory	---	---	loblolly pine,
					Chestnut oak	56	39	white oak.
					Scarlet oak	62	45	
					Black oak	60	43	
					Post oak	46	31	
SaA, SaB2 Sadler	Slight	Slight	Slight	Severe	Yellow-poplar	85	81	Yellow-poplar,
					White oak	65	47	white oak,
					Black oak	70	52	eastern white pine,
					American beech	---	---	shortleaf pine,
					Black cherry	---	---	loblolly pine.
					Red maple	---	---	
					Sourwood	---	---	
					Sweetgum	---	---	
ScA, ScB Sciotoville	Slight	Slight	Slight	Severe	Northern red oak	80	62	Eastern white pine,
					Yellow-poplar	90	90	yellow-poplar,
					Sugar maple	---	---	white ash,
					Black cherry	---	---	white oak,
					White ash	---	---	northern red oak,
					White oak	78	60	eastern cottonwood.
Sf Steff	Slight	Slight	Moderate	Severe	Yellow-poplar	107	119	Yellow-poplar,
					River birch	---	---	eastern white pine,
					Silver maple	---	---	sweetgum,
					American sycamore	---	---	white oak,
					Black oak	88	70	white ash,
					White oak	---	---	northern red oak.
					Sweetgum	100	138	
					White ash	---	---	
					Red maple	---	---	
					Blackgum	---	---	
St Stendal	Slight	Moderate	Moderate	Severe	Pin oak	95	92	Eastern white pine,
					Sweetgum	91	109	American sycamore,
					Yellow-poplar	104	114	green ash.
					White oak	---	---	
					Red maple	---	---	
VrF**:								
Varilla (cool aspect)	Moderate	Severe	Moderate	Moderate	White oak	75	57	Yellow-poplar,
					Yellow-poplar	95	98	white oak,
					Eastern hemlock	---	---	shortleaf
					American beech	---	---	pine, eastern
								white pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
VrF**:								
Gilpin (cool aspect)	Severe	Severe	Slight	Moderate	Black oak	79	61	Virginia pine,
					Yellow-poplar	90	90	eastern white pine,
					White oak	73	55	white oak,
					Scarlet oak	77	59	yellow-poplar.
					Chestnut oak	76	58	
					Shortleaf pine	70	110	
Rock outcrop.								
VrF**:								
Varilla (warm aspect)	Moderate	Severe	Severe	Moderate	White oak	65	47	White oak,
					Scarlet oak	70	52	shortleaf
					Virginia pine	---	---	pine.
					Red maple	---	---	
Gilpin (warm aspect)	Severe	Severe	Moderate	Moderate	Northern red oak	70	52	Loblolly pine,
					Black oak	70	52	Virginia pine,
					White oak	65	47	eastern white pine,
					Scarlet oak	72	54	shortleaf pine,
					Chestnut oak	68	50	white oak.
					Virginia pine	66	102	
Rock outcrop.								
We	Slight	Moderate	Slight	Severe	White oak	75	57	Yellow-poplar,
Weinbach					Pin oak	88	83	eastern white pine,
					Yellow-poplar	90	90	sweetgum,
					Sweetgum	88	101	green ash,
								loblolly pine,
								American sycamore.
WtF**:								
Westmoreland (cool aspect)	Severe	Severe	Slight	Severe	Northern red oak	79	61	Yellow-poplar,
					Yellow-poplar	90	90	eastern white pine,
					White oak	73	55	shortleaf pine,
					Black oak	78	60	loblolly pine.
Caneyville (cool aspect)	Severe	Severe	Slight	Severe	Black oak	71	53	White oak,
					White oak	64	47	yellow-poplar,
					Sugar maple	---	---	white ash,
					Hickory	---	---	eastern white pine,
					White ash	75	---	loblolly pine.
					Eastern redcedar	46	54	
					Yellow-poplar	90	90	
Rock outcrop.								
WtF**:								
Westmoreland (warm aspect)	Severe	Severe	Moderate	Severe	Northern red oak	72	54	Eastern white pine,
					White oak	64	47	white oak,
					Scarlet oak	75	57	shortleaf pine,
								loblolly pine.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
WtF**:								
Caneyville (warm aspect)-	Severe	Severe	Moderate	Slight	Black oak	67	49	Virginia pine, eastern redcedar, loblolly pine.
					White oak	58	41	
					Sugar maple	---	---	
					Hickory	---	---	
					Eastern redcedar	36	38	
					Chinkapin oak	44	29	
					Scarlet oak	52	36	
Rock outcrop.								
WxB, WxC2------- Wheeling	Slight	Slight	Slight	Severe	Northern red oak	80	62	Eastern white pine, yellow-poplar, black walnut, white oak, loblolly pine.
					Yellow-poplar	90	90	
Ya---------- Yeager	Slight	Slight	Moderate	Moderate	Yellow-poplar	90	90	Yellow-poplar, white oak, northern red oak, sweetgum, eastern white pine.
					Sweetgum	90	106	
					Hackberry	---	---	
					Boxelder	---	---	
					Green ash	---	---	
					Sugar maple	---	---	
					American beech	---	---	
					Black cherry	---	---	
					American sycamore	---	---	
					Butternut	---	---	
ZaB2, ZaC2------ Zanesville	Slight	Slight	Slight	Severe	Virginia pine	66	104	Yellow-poplar, white ash, white oak, northern red oak, eastern white pine, shortleaf pine.
					Black oak	77	59	
					White oak	70	52	
					Hickory	---	---	
					Yellow-poplar	90	90	
					Shortleaf pine	64	97	
					Loblolly pine	90	131	
ZnC3---------- Zanesville	Slight	Slight	Moderate	Moderate	Virginia pine	60	91	Shortleaf pine, eastern white pine, white oak, loblolly pine.
					Black oak	70	52	
					White oak	60	43	
					Scarlet oak	---	---	
					Black locust	---	---	
					Post oak	---	---	

* Volume is the yield in cubic feet per acres per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AlB2 Alford	Slight	Slight	Moderate: slope.	Slight	Slight.
AlC2 Alford	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
AlD2 Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
BaB2 Baxter	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
BaC2, BbC3, BeC4 Baxter	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
BaD2, BbD3, BeD4 Baxter	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BaE2 Baxter	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CaC2 Caneyville	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer.
CaD2 Caneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
CeC3 Caneyville	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey.	Severe: too clayey.
CeD3 Caneyville	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: too clayey.	Severe: slope, too clayey.
CkD*: Caneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Rock outcrop.					
Cn Chagrin	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Co Clifty	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, flooding.
CrB2 Crider	Slight	Slight	Moderate: slope.	Slight	Slight.
CrC2, CtC3 Crider	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CrD2, CtD3---------- Crider	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Cu---------- Cuba	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
EkA---------- Elk	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
EkB---------- Elk	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
EkC2---------- Elk	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
EkD2, EkD3---------- Elk	Severe: flooding, slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
EkE---------- Elk	Severe: flooding, slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
FcC2*: Fredonia----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer.
Crider----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
FcD2*: Fredonia----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Crider----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
FrD3*: Fredonia----------	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer.
Crider----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
GaB2---------- Gatton	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
GlC2, GlC3---------- Gilpin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, thin layer.
GwF*: Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GwF*:					
Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
Rock outcrop.					
HaB2 Hammack	Slight	Slight	Moderate: slope.	Slight	Slight.
HbC2*, HbC3*:					
Hammack	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Baxter	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
HoB2 Hosmer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, percs slowly, wetness.	Slight	Slight.
HoC2 Hosmer	Moderate: wetness, percs slowly.	Moderate: slope, percs slowly, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Hu Huntington	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
LaB Lakin	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
LaC Lakin	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: slope, droughty.
Ld Lindside	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
Ln Lindside	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
MaC3 Markland	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MaD3 Markland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Mc McGary	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Me Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Mf Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Na Newark	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ne Newark	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
NhB2 Nicholson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
NhC2, NkC4 Nicholson	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
No Nolin	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Nv Nolin	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
PeA, PeB Pekin	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, erodes easily.	Moderate: wetness.
Pt*. Pits, quarries					
RaC2 Riney	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
ReD*: Riney	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lily	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
ReE*: Riney	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lily	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rf Robbs	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
RkF*: Rock outcrop.					
Caneyville	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RmD*:					
Rock outcrop.					
Corydon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
RnC2, RoC3	Moderate:	Moderate:	Severe:	Severe:	Moderate:
Rosine	slope, percs slowly.	slope, percs slowly.	slope.	erodes easily.	slope.
RsD2*, RsD3*:					
Rosine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lenberg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
RsE*:					
Rosine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lenberg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
SaA	Moderate:	Moderate:	Moderate:	Moderate:	Moderate:
Sadler	wetness, percs slowly.	wetness, percs slowly.	wetness, percs slowly.	wetness.	wetness.
SaB2	Moderate:	Moderate:	Moderate:	Moderate:	Moderate:
Sadler	wetness, percs slowly.	wetness, percs slowly.	slope, wetness, percs slowly.	wetness.	wetness.
ScA	Moderate:	Moderate:	Moderate:	Moderate:	Moderate:
Sciotoville	wetness, percs slowly.	wetness, percs slowly.	wetness, percs slowly.	wetness.	wetness.
ScB	Moderate:	Moderate:	Moderate:	Moderate:	Moderate:
Sciotoville	wetness, percs slowly.	wetness, percs slowly.	slope, wetness, percs slowly.	wetness.	wetness.
Sf	Severe:	Moderate:	Moderate:	Moderate:	Moderate:
Steff	flooding.	wetness.	flooding, wetness.	wetness.	wetness, flooding.
St	Severe:	Moderate:	Severe:	Moderate:	Moderate:
Stendal	flooding, wetness.	wetness.	wetness.	wetness.	wetness, flooding.
VrF*:					
Varilla	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
VrF*:					
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
W*.					
Water					
We	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Weinbach					
WtF*:					
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Caneyville	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
Rock outcrop.					
WxB	Slight	Slight	Moderate: slope.	Slight	Slight.
Wheeling					
WxC2	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Wheeling					
Ya	Severe: flooding.	Moderate: too sandy.	Moderate: flooding, too sandy.	Moderate: too sandy.	Moderate: droughty, flooding.
Yeager					
ZaB2	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.	Slight.
Zanesville					
ZaC2, ZnC3	Moderate: slope, percs slowly, wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Zanesville					

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AlB2--- Alford	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AlC2--- Alford	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AlD2--- Alford	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BaB2--- Baxter	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaC2--- Baxter	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BaD2--- Baxter	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BaE2--- Baxter	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BbC3--- Baxter	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BbD3--- Baxter	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeC4--- Baxter	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeD4--- Baxter	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CaC2--- Caneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CaD2--- Caneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CeC3--- Caneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CeD3--- Caneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CkD*: Caneyville---	Very poor	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
Cn--- Chagrin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Co--- Clifty	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CrB2---------- Crider	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrC2---------- Crider	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CrD2---------- Crider	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CtC3---------- Crider	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CtD3---------- Crider	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cu---------- Cuba	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
EkA, EkB---------- Elk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EkC2---------- Elk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EkD2, EkD3--------- Elk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EkE---------- Elk	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FcC2*:										
Fredonia----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Crider----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FcD2*:										
Fredonia----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Crider----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FrD3*:										
Fredonia----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Crider----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
GaB2---------- Gatton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GlC2, GlC3--------- Gilpin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
GwF*:										
Gilpin----------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
GwF*:										
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
HaB2 Hammack	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HbC2*, HbC3*:										
Hammack	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Baxter	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HoB2 Hosmer	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HoC2 Hosmer	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Hu Huntington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LaB, LaC Lakin	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Ld Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ln Lindside	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
MaC3 Markland	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MaD3 Markland	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Mc McGary	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Me Melvin	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Mf Melvin	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Na, Ne Newark	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
NhB2 Nicholson	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NhC2 Nicholson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NkC4 Nicholson	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
No---------- Nolin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Nv---------- Nolin	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Fair	Very poor.
PeA---------- Pekin	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
PeB---------- Pekin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pt*. Pits, quarries										
RaC2---------- Riney	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ReD*: Riney----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lily----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ReE*: Riney----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lily----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rf---------- Robbs	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
RkF*: Rock outcrop.										
Caneyville--------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
RmD*: Rock outcrop.										
Corydon----------	Very poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
RnC2, RoC3--------- Rosine	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
RsD2*, RsD3*: Rosine----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Gilpin----------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Lenberg----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
RsE*:										
Rosine	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Gilpin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Lenberg	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SaA---------- Sadler	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SaB2---------- Sadler	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ScA---------- Sciotoville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ScB---------- Sciotoville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sf---------- Steff	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
St---------- Stendal	Fair	Good	Fair	Good	Good	Good	Fair	Fair	Good	Fair.
VrF*:										
Varilla	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Gilpin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
W*. Water										
We---------- Weinbach	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
WtF*:										
Westmoreland	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Caneyville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
WxB---------- Wheeling	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WxC2---------- Wheeling	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ya---------- Yeager	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ZaB2---------- Zanesville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ZaC2, ZnC3--------- Zanesville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AlB2---------- Alford	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
AlC2---------- Alford	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
AlD2---------- Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BaB2---------- Baxter	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones.
BaC2---------- Baxter	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
BaD2, BaE2------ Baxter	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BbC3---------- Baxter	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
BbD3---------- Baxter	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BeC4---------- Baxter	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
BeD4---------- Baxter	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
CaC2---------- Caneyville	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
CaD2---------- Caneyville	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
CeC3---------- Caneyville	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: too clayey.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CeD3---------- Caneyville	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, too clayey.
CkD*: Caneyville-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
Cn---------- Chagrin	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Co---------- Clifty	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones, flooding.
CrB2---------- Crider	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
CrC2---------- Crider	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
CrD2---------- Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
CtC3---------- Crider	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
CtD3---------- Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Cu---------- Cuba	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
EkA---------- Elk	Moderate: too clayey.	Slight---------	Slight---------	Slight---------	Severe: low strength.	Slight.
EkB---------- Elk	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
EkC2---------- Elk	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
EkD2, EkD3, EkE- Elk	Severe: slope.	Severe: flooding, slope.	Severe: flooding, slope.	Severe: flooding, slope.	Severe: low strength, slope.	Severe: slope.
FcC2*: Fredonia-------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FcC2*:						
Crider	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
FcD2*:						
Fredonia	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
FrD3*:						
Fredonia	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Crider	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
GaB2 Gatton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: wetness.
GlC2, GlC3 Gilpin	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Moderate: slope, thin layer.
GwF*:						
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Rock outcrop.						
HaB2 Hammack	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
HbC2*, HbC3*:						
Hammack	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Baxter	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
HoB2 Hosmer	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
HoC2 Hosmer	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, slope.	Moderate: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Hu--- Huntington	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
LaB--- Lakin	Severe: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight---	Moderate: droughty.
LaC--- Lakin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
Ld--- Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Ln--- Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
MaC3--- Markland	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
MaD3--- Markland	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Mc--- McGary	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
Me--- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Mf--- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Na--- Newark	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Ne--- Newark	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
NhB2--- Nicholson	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
NhC2, NkC4--- Nicholson	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
No Nolin	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Nv Nolin	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
PeA Pekin	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
PeB Pekin	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
Pt*. Pits, quarries						
RaC2 Riney	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
ReD*, ReE*: Riney	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lily	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rf Robbs	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
RkF*: Rock outcrop.						
Caneyville	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: low strength, slope, depth to rock.	Severe: slope, depth to rock.
RmD*: Rock outcrop.						
Corydon	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: slope, depth to rock.
RnC2, RoC3 Rosine	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
RsD2*, RsD3*, RsE*: Rosine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RsD2*, RsD3*, RsE*:						
Lenberg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
SaA---------- Sadler	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
SaB2---------- Sadler	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
ScA---------- Sciotoville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
ScB---------- Sciotoville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
Sf---------- Steff	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Moderate: wetness, flooding.
St---------- Stendal	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength.	Moderate: wetness, flooding.
VrF*:						
Varilla	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
W*. Water						
We---------- Weinbach	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
WtF*:						
Westmoreland	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Caneyville	Severe: depth to rock, slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock.
Rock outcrop.						
WxB---------- Wheeling	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.	Slight.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WxC2---------- Wheeling	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Ya---------- Yeager	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
ZaB2---------- Zanesville	Moderate: depth to rock, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: low strength.	Slight.
ZaC2, ZnC3------ Zanesville	Moderate: slope, wetness, depth to rock.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AlB2---- Alford	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
AlC2---- Alford	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
AlD2---- Alford	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BaB2---- Baxter	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
BaC2---- Baxter	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BaD2, BaE2---- Baxter	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
BbC3---- Baxter	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BbD3---- Baxter	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
BeC4---- Baxter	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BeD4---- Baxter	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope, hard to pack.
CaC2---- Caneyville	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
CaD2---- Caneyville	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
CeC3---- Caneyville	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CeD3---------- Caneyville	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
CkD*: Caneyville---------	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
Cn---------- Chagrin	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Fair: thin layer.
Co---------- Clifty	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: small stones.
CrB2---------- Crider	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
CrC2---------- Crider	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
CrD2---------- Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
CtC3---------- Crider	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
CtD3---------- Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Cu---------- Cuba	Severe: flooding.	Severe: flooding.	Severe: flooding, too sandy.	Severe: flooding.	Poor: too sandy.
EkA---------- Elk	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey, thin layer.
EkB---------- Elk	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, thin layer.
EkC2---------- Elk	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
EkD2, EkD3, EkE----- Elk	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FcC2*:					
Fredonia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Crider	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
FcD2*:					
Fredonia	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Crider	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
FrD3*:					
Fredonia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Crider	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
GaB2 Gatton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: wetness, thin layer.
GlC2, GlC3 Gilpin	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.
GwF*:					
Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, depth to rock, thin layer.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.
Rock outcrop.					
HaB2 Hammack	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, thin layer.
HbC2*, HbC3*:					
Hammack	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HbC2*, HbC3*: Baxter	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
HoB2 Hosmer	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: wetness.
HoC2 Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope, wetness.
Hu Huntington	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
LaB Lakin	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
LaC Lakin	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
Ld, Ln Lindside	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
MaC3 Markland	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
MaD3 Markland	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness, slope, too clayey.	Severe: wetness, slope.	Poor: too clayey, hard to pack, slope.
Mc McGary	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Me, Mf Melvin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Na, Ne Newark	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
NhB2 Nicholson	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
NhC2, NkC4 Nicholson	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
No, Nv Nolin	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PeA, PeB---------- Pekin	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Pt*. Pits, quarries					
RaC2---------- Riney	Moderate: depth to rock, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: depth to rock, too clayey, slope.
ReD*, ReE*: Riney----------	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
Lily----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Rf---------- Robbs	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RkF*: Rock outcrop.					
Caneyville---------	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, slope.
RmD*: Rock outcrop.					
Corydon----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
RnC2, RoC3---------- Rosine	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
RsD2*, RsD3*, RsE*: Rosine----------	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Gilpin----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, depth to rock, thin layer.
Lenberg----------	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SaA, SaB2 Sadler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Moderate: depth to rock, wetness.	Fair: depth to rock, too clayey, small stones.
ScA, ScB Sciotoville	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Sf Steff	Severe: flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Fair: too clayey, wetness.
St Stendal	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
VrF*: Varilla	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: large stones, slope.
Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, depth to rock, thin layer.
Rock outcrop.					
W*. Water					
We Weinbach	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
WtF*: Westmoreland	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.
Caneyville	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, slope.
Rock outcrop.					
WxB Wheeling	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
WxC2 Wheeling	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: slope, thin layer.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ya Yeager	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage.
ZaB2 Zanesville	Severe: percs slowly, wetness.	Severe: wetness.	Severe: depth to rock.	Moderate: depth to rock, wetness.	Fair: too clayey, depth to rock.
ZaC2, ZnC3 Zanesville	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: depth to rock.	Moderate: depth to rock, slope, wetness.	Fair: slope, too clayey, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AlB2 Alford	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
AlC2 Alford	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
AlD2 Alford	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BaB2, BaC2 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BaD2 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BaE2 Baxter	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BbC3 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BbD3 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BeC4 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BeD4 Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CaC2 Caneyville	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CaD2 Caneyville	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
CeC3 Caneyville	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CeD3 Caneyville	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CkD*:				
Caneyville	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
Cn Chagrin	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Co Clifty	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CrB2 Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CrC2 Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
CrD2 Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CtC3 Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
CtD3 Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cu Cuba	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
EkA, EkB Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
EkC2 Elk	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
EkD2, EkD3 Elk	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
EkE Elk	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
FcC2*:				
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
FcD2*:				
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
FrD3*:				
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
GaB2 Gatton	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
GlC2, GlC3 Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
GwF*:				
Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Rock outcrop.				
HaB2 Hammack	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HbC2*, HbC3*:				
Hammack	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HoB2 Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
HoC2 Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Hu Huntington	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LaB Lakin	Good	Probable	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LaC---------- Lakin	Good----------	Probable----------	Improbable: excess fines.	Fair: too sandy, slope.
Ld, Ln---------- Lindside	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
MaC3---------- Markland	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MaD3---------- Markland	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Mc---------- McGary	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Me, Mf---------- Melvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Na, Ne---------- Newark	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
NhB2---------- Nicholson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
NhC2, NkC4---------- Nicholson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
No, Nv---------- Nolin	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
PeA, PeB---------- Pekin	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Pt*. Pits, quarries				
RaC2---------- Riney	Fair: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
ReD*: Riney----------	Fair: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Lily----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
ReE*: Riney----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ReE*:				
Lily	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rf	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
RkF*:				
Rock outcrop.				
Caneyville	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope, depth to rock.
RmD*:				
Rock outcrop.				
Corydon	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
RnC2, RoC3	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
RsD2*, RsD3*:				
Rosine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lenberg	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
RsE*:				
Rosine	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Lenberg	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
SaA, SaB2	Fair: area reclaim, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Sadler				

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ScA, ScB---------- Sciotoville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Sf---------- Steff	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
St---------- Stendal	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
VrF*:				
Varilla----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
Gilpin----------	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Rock outcrop.				
W*. Water				
We---------- Weinbach	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
WtF*:				
Westmoreland---------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Caneyville----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope, depth to rock.
Rock outcrop.				
WxB---------- Wheeling	Fair: low strength.	Probable----------	Probable----------	Fair: small stones.
WxC2---------- Wheeling	Fair: low strength.	Probable----------	Probable----------	Fair: small stones, slope.
Ya---------- Yeager	Good----------	Probable----------	Probable----------	Fair: small stones, area reclaim.
ZaB2, ZaC2, ZnC3------ Zanesville	Severe: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
AlB2---------- Alford	Moderate: seepage, slope.	Moderate: piping.	Deep to water----	Erodes easily----	Erodes easily.
AlC2, AlD2-------- Alford	Severe: slope.	Moderate: piping.	Deep to water----	Slope, erodes easily.	Slope, erodes easily.
BaB2---------- Baxter	Moderate: seepage.	Moderate: hard to pack.	Deep to water----	Favorable--------	Favorable.
BaC2, BaD2-------- Baxter	Moderate: seepage.	Moderate: hard to pack.	Deep to water----	Slope----------	Slope.
BaE2---------- Baxter	Severe: slope.	Moderate: hard to pack.	Deep to water----	Slope----------	Slope.
BbC3, BbD3, BeC4, BeD4---------- Baxter	Moderate: seepage.	Moderate: hard to pack.	Deep to water----	Slope----------	Slope.
CaC2, CaD2-------- Caneyville	Moderate: depth to rock.	Severe: thin layer, hard to pack.	Deep to water----	Slope, depth to rock.	Slope, depth to rock.
CeC3, CeD3-------- Caneyville	Moderate: depth to rock, slope.	Moderate: hard to pack.	Deep to water----	Slope, depth to rock.	Slope, depth to rock.
CkD*: Caneyville-------	Severe: slope.	Severe: thin layer, hard to pack.	Deep to water----	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop.					
Cn---------- Chagrin	Moderate: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
Co---------- Clifty	Severe: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
CrB2---------- Crider	Moderate: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
CrC2, CrD2, CtC3, CtD3---------- Crider	Moderate: seepage.	Severe: piping.	Deep to water----	Slope----------	Slope.
Cu---------- Cuba	Moderate: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
EkA---------- Elk	Moderate: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
EkB---------- Elk	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
EkC2, EkD2, EkD3, EkE---------- Elk	Severe: slope.	Severe: piping.	Deep to water----	Slope, erodes easily.	Slope, erodes easily.
FcC2*, FcD2*, FrD3*: Fredonia--------	Severe: slope.	Severe: hard to pack.	Deep to water----	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Crider----------	Moderate: seepage.	Severe: piping.	Deep to water----	Slope----------	Slope.
GaB2---------- Gatton	Moderate: seepage.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
GlC2, GlC3-------- Gilpin	Severe: slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
GwF*: Gilpin----------	Severe: slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Dekalb----------	Severe: seepage, slope.	Severe: piping, large stones.	Deep to water----	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Rock outcrop.					
HaB2---------- Hammack	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Large stones-----	Favorable.
HbC2*, HbC3*: Hammack----------	Severe: slope.	Severe: piping.	Deep to water----	Slope, large stones.	Slope.
Baxter----------	Moderate: seepage.	Moderate: hard to pack.	Deep to water----	Slope----------	Slope.
HoB2---------- Hosmer	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
HoC2---------- Hosmer	Severe: slope.	Severe: piping.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
Hu---------- Huntington	Moderate: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
LaB---------- Lakin	Severe: seepage.	Severe: seepage, piping.	Deep to water----	Too sandy--------	Droughty.

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
LaC---------- Lakin	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water----	Slope, too sandy.	Slope, droughty.
Ld---------- Lindside	Severe: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness.	Erodes easily.
Ln---------- Lindside	Severe: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness, poor outlets.	Erodes easily.
MaC3, MaD3-------- Markland	Severe: slope.	Severe: hard to pack.	Deep to water----	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Mc---------- McGary	Slight----------	Severe: wetness.	Percs slowly-----	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Me---------- Melvin	Moderate: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness.	Wetness, erodes easily.
Mf---------- Melvin	Moderate: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness, poor outlets.	Wetness, erodes easily.
Na---------- Newark	Moderate: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness.	Wetness, erodes easily.
Ne---------- Newark	Moderate: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness, poor outlets.	Wetness, erodes easily.
NhB2---------- Nicholson	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
NhC2, NkC4-------- Nicholson	Severe: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
No---------- Nolin	Severe: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
Nv---------- Nolin	Severe: seepage.	Severe: piping.	Deep to water----	Erodes easily, poor outlets.	Erodes easily.
PeA---------- Pekin	Moderate: seepage.	Severe: piping.	Percs slowly-----	Erodes easily, wetness.	Erodes easily, rooting depth.
PeB---------- Pekin	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
Pt*. Pits, quarries					

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
RaC2--Riney	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
ReD*:					
Riney	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
Lily	Severe: seepage.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
ReE*:					
Riney	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
Rf--Robbs	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
RkF*:					
Rock outcrop.					
Caneyville	Severe: slope, depth to rock.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
RmD*:					
Rock outcrop.					
Corydon	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
RnC2, RoC3--Rosine	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
RsD2*, RsD3*:					
Rosine	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Gilpin	Severe: slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Lenberg	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
RsE*:					
Rosine	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
RsE*:					
Gilpin	Severe: slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Lenberg	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
SaA	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
SaB2	Moderate: seepage, depth to rock, slope.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
ScA	Moderate: seepage.	Severe: piping.	Percs slowly	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
ScB	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
Sf	Moderate: seepage.	Severe: piping, wetness.	Flooding	Erodes easily, wetness.	Erodes easily.
St	Moderate: seepage.	Severe: piping, wetness.	Flooding	Erodes easily, wetness.	Wetness, erodes easily.
VrF*:					
Varilla	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, too sandy.	Large stones, slope, droughty.
Gilpin	Severe: slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, large stones.	Slope, depth to rock, large stones.
Rock outcrop.					
W* Water					
We Weinbach	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
WtF*:					
Westmoreland	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
Caneyville	Severe: slope, depth to rock.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rock outcrop.					

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
WxB---------- Wheeling	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
WxC2---------- Wheeling	Severe: slope.	Severe: piping.	Deep to water----	Slope----------	Slope.
Ya---------- Yeager	Severe: seepage.	Severe: seepage, piping.	Deep to water----	Favorable--------	Droughty, rooting depth.
ZaB2---------- Zanesville	Moderate: depth to rock, seepage.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
ZaC2, ZnC3-------- Zanesville	Moderate: depth to rock, seepage.	Severe: piping.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
AlB2, AlC2, AlD2-Alford	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	75-100	75-100	75-100	20-30	3-12
	9-72	Silty clay loam, silt loam.	CL, ML, CL-ML	A-6, A-4	0	100	100	90-100	80-100	20-40	4-20
BaB2, BaC2, BaD2, BaE2-Baxter	0-5	Very gravelly silt loam.	ML, GM, CL-ML, GM-GC	A-4	0-10	55-90	45-60	45-60	45-60	25-35	4-10
	5-11	Gravelly silty clay, gravelly clay.	CL, GC, CH, SC	A-7	0-10	60-90	55-80	55-80	45-80	40-60	20-35
	11-37	Gravelly silty clay, gravelly clay.	CH, CL, GC, SC	A-7	0-10	55-90	45-85	45-85	45-80	40-60	20-35
	37-97	Gravelly clay, gravelly silty clay.	GC, CH, SC, CL	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
BbC3, BbD3, BeC4, BeD4-Baxter	0-6	Very gravelly silty clay loam.	CL	A-6	0-10	55-85	45-60	45-60	45-60	30-40	15-22
	6-30	Gravelly silty clay, gravelly clay.	CH, CL, GC, SC	A-7	0-10	55-90	45-85	45-85	45-80	40-60	20-35
	30-90	Gravelly clay, gravelly silty clay.	GC, CH, SC, CL	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
CaC2, CaD2-Caneyville	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	75-100	60-95	20-35	2-12
	6-10	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	10-24	Clay, silty clay	CH	A-7	0-10	90-100	85-100	75-100	65-100	50-75	30-45
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CeC3, CeD3-Caneyville	0-5	Silty clay	CH, CL	A-7	0-3	90-100	85-100	80-100	75-100	45-65	25-45
	5-23	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-10	90-100	85-100	75-100	65-100	42-70	20-45
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CkD*:											
Caneyville	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	75-100	60-95	20-35	2-12
	6-10	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	10-24	Clay, silty clay	CH	A-7	0-10	90-100	85-100	75-100	65-100	50-75	30-45
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Cn---------- Chagrin	0-9	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	95-100	75-100	55-85	35-55	<25	NP-5
	9-37	Silt loam, loam, sandy loam.	ML, SM	A-4, A-2, A-6	0	90-100	75-100	55-90	30-80	20-40	NP-14
	37-63	Silt loam to gravelly fine sand.	ML, SM, SP-SM	A-4, A-2	0	75-100	65-100	40-85	10-80	20-40	NP-10
Co---------- Clifty	0-8	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	65-85	60-85	55-75	45-70	20-35	2-10
	8-34	Gravelly silt loam, gravelly loam, gravelly sandy clay loam.	ML, CL-ML, GM, GM-GC	A-4	0-15	55-75	50-70	45-65	35-60	20-35	2-10
	34-64	Gravelly silt loam, very gravelly loam, gravelly sandy loam.	GM, GM-GC, SM	A-2, A-4, A-1	0-25	40-75	35-70	25-60	15-50	<30	NP-7
CrB2, CrC2, CrD2- Crider	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	85-100	25-35	3-12
	7-31	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	3-20
	31-80	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	90-100	85-100	70-100	60-100	35-65	15-40
CtC3, CtD3------- Crider	0-6	Silty clay loam	CL	A-7, A-6	0	100	95-100	90-100	85-100	30-42	8-20
	6-26	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	3-20
	26-75	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	90-100	85-100	70-100	60-100	35-65	15-42
Cu---------- Cuba	0-30	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-90	25-35	3-12
	30-66	Stratified silt loam to fine sand.	CL, ML, CL-ML	A-4	0	100	80-100	75-100	50-85	15-30	2-10
EkA, EkB--------- Elk	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	8-51	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	51-76	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML, SC-SM	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
EkC2, EkD2------- Elk	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	8-48	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	48-75	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML, SC-SM	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
EkD3---------- Elk	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	7-45	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	45-70	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML, SC-SM	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
EkE---------- Elk	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
	8-51	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	51-76	Silty clay loam, silt loam, silty clay.	ML, CL, CL-ML, SC-SM	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
FcC2*, FcD2*: Fredonia--------	0-4	Silt loam--------	CL	A-6, A-4	0-5	95-100	90-100	85-100	75-100	25-40	8-20
	4-30	Silty clay, clay	CH, MH, CL	A-7	0-5	95-100	90-100	85-100	80-100	45-75	20-45
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Crider----------	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	85-100	25-35	3-12
	7-31	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	3-20
	31-80	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	90-100	85-100	70-100	60-100	35-65	15-40
FrD3*: Fredonia--------	0-3	Silty clay loam	CL	A-6, A-4	0-5	95-100	90-100	85-100	75-100	25-40	8-20
	3-27	Silty clay, clay	CH, MH, CL	A-7	0-5	95-100	90-100	85-100	80-100	45-75	20-45
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Crider----------	0-6	Silty clay loam	CL	A-7, A-6	0	100	95-100	90-100	85-100	30-42	8-20
	6-26	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	3-20
	26-75	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	90-100	85-100	70-100	60-100	35-65	15-40
GaB2---------- Gatton	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	90-100	70-90	25-35	4-10
	6-20	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	90-100	70-90	20-45	4-22
	20-34	Fine sandy loam, loam, sandy clay loam.	ML, SM, SC, CL	A-4	0	95-100	90-100	75-95	40-70	<30	NP-10
	34-72	Sandy clay, clay, clay loam.	CL, SC, CH	A-6, A-7	0	95-100	90-100	75-95	40-80	25-60	11-35

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
GlC2----------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
Gilpin	5-24	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-29	Channery loam, very channery silt loam, very channery loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GlC3----------	0-3	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
Gilpin	3-19	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	19-24	Channery loam, very channery silt loam, very channery loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GwF*											
Gilpin----------	0-10	Loam----------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	10-24	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-29	Channery loam, very channery silt loam, very channery loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dekalb----------	0-5	Loam----------	ML, CL-ML	A-4	0-10	80-90	75-85	70-80	55-70	10-32	NP-10
	5-28	Channery sandy loam, channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-80	40-75	20-55	15-32	NP-9
	28-38	Channery sandy loam, extremely channery sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
HaB2---------- Hammack	0-9	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	9-27	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	27-40	Very gravelly silt loam, extremely gravelly silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	40-86	Gravelly silty clay, gravelly clay, clay.	GC, CL, CH	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
HbC2*:											
Hammack----------	0-9	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	9-27	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	27-40	Very gravelly silt loam, extremely gravelly silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	40-86	Gravelly silty clay, gravelly clay, clay.	GC, CL, CH	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
Baxter----------	0-5	Very gravelly silt loam.	ML, GM, CL-ML, GM-GC	A-4	0-10	55-90	45-60	45-60	45-60	25-35	4-10
	5-11	Gravelly silty clay, gravelly clay.	CL, GC, CH, SC	A-7	0-10	60-90	55-80	55-80	45-80	40-60	20-35
	11-37	Gravelly silty clay, gravelly clay.	CH, CL, GC, SC	A-7	0-10	55-90	45-85	45-85	45-80	40-60	20-35
	37-97	Gravelly clay, gravelly silty clay.	GC, CH, SC, CL	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
HbC3*:											
Hammack----------	0-5	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-100	34-45	15-20
	5-23	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	23-36	Very gravelly silt loam, extremely gravelly silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	36-82	Gravelly silty clay, gravelly clay, clay.	GC, CL, CH	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
HbC3*:											
Baxter	0-6	Very gravelly silty clay loam.	CL	A-6	0-10	55-85	45-60	45-60	45-60	30-40	15-22
	6-30	Gravelly silty clay, gravelly clay.	CL, GC, CH, SC	A-7	0-10	55-90	45-85	40-85	45-80	40-60	20-35
	30-90	Gravelly silty clay, gravelly clay.	CH, CL, GC, SC	A-7	0-20	50-90	40-75	35-70	35-70	45-70	20-40
HoB2, HoC2----- Hosmer	0-9	Silt loam--------	ML, CL	A-4, A-6	0	100	100	90-100	80-100	25-35	5-15
	9-25	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	25-70	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
Hu---------- Huntington	0-15	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-95	25-40	5-15
	15-46	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-95	25-40	5-15
	46-70	Stratified fine sand to silty clay loam.	SM, SC, ML, CL	A-2, A-4	0-10	95-100	60-100	50-90	30-75	<30	NP-10
LaB, LaC--------- Lakin	0-11	Loamy fine sand	SM, SC-SM	A-2	0	95-100	95-100	95-100	10-35	<30	NP-7
	11-65	Loamy sand, fine sand, loamy fine sand.	SM, SC-SM, SP-SM	A-2, A-3	0	95-100	95-100	90-100	5-35	<30	NP-7
Ld, Ln---------- Lindside	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	20-35	2-15
	8-49	Silty clay loam, silt loam, very fine sandy loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-95	25-40	4-18
	49-65	Stratified silty clay loam to gravelly sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	60-100	55-100	45-100	30-95	20-40	4-18
MaC3, MaD3------ Markland	0-2	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	10-20
	2-36	Silty clay, clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	90-95	45-60	19-32
	36-67	Stratified clay to silty clay loam.	CL, CH, ML, MH	A-7	0	100	100	90-100	75-95	40-55	15-25
Mc---------- McGary	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	25-40	5-15
	7-64	Silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	90-100	45-60	25-35
Me, Mf---------- Melvin	0-7	Silt loam--------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	7-65	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-95	25-40	5-20

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Na, Ne Newark	0-9	Silt loam	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<32	NP-10
	9-30	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-100	22-42	3-20
	30-68	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-3	75-100	70-100	65-100	55-95	22-42	3-20
NhB2, NhC2 Nicholson	0-8	Silt loam	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	80-95	25-35	5-10
	8-23	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	85-100	85-100	80-100	25-45	5-20
	23-43	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	90-100	80-100	75-100	25-45	5-20
	43-70	Silty clay, clay, gravelly silty clay.	CH, CL	A-6, A-7	0-10	80-100	70-100	60-100	55-100	34-70	16-40
NkC4 Nicholson	0-6	Silt loam	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	80-95	25-35	5-10
	6-18	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	85-100	85-100	80-100	25-45	5-20
	18-38	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	90-100	80-100	75-100	25-45	5-20
	38-68	Silty clay, clay, gravelly silty clay.	CH, CL	A-6, A-7	0-10	80-100	70-100	60-100	55-100	34-70	16-40
No, Nv Nolin	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	25-40	5-18
	8-62	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	100	95-100	85-100	75-100	25-46	5-23
	62-72	Loam, silt loam, gravelly loam.	ML, CL, CL-ML, GM	A-4, A-6	0-10	50-100	50-100	40-95	35-95	<30	NP-15
PeA, PeB Pekin	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	100	95-100	85-100	65-100	20-30	5-15
	10-26	Silt loam, silty clay loam.	CL	A-6	0	100	95-100	90-100	70-100	25-40	10-20
	26-50	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	95-100	88-98	65-90	25-35	5-15
	50-64	Stratified fine sandy loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	90-100	80-95	50-85	20-40	5-15
Pt* Pits, quarries											
RaC2 Riney	0-8	Loam	CL, ML, SM, SC	A-4	0	90-100	85-100	65-80	35-75	10-30	NP-10
	8-50	Clay loam, sandy clay loam.	ML, CL, SC, SC-SM	A-6, A-2, A-4	0	80-100	70-100	70-85	25-75	20-35	2-15
	50-62	Sandy loam, sandy clay loam, loamy sand.	SC, ML, CL, SC-SM	A-4, A-6, A-2	0	80-100	70-100	40-80	15-55	0-35	NP-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
ReD*, ReE*:											
Riney	0-8	Loam	CL, ML, SM, SC	A-4	0	90-100	85-100	65-80	35-75	10-30	NP-10
	8-50	Clay loam, sandy clay loam.	ML, CL, SC, SC-SM	A-6, A-2, A-4	0	80-100	70-100	70-85	25-75	20-35	2-15
	50-62	Sandy loam, sandy clay loam, loamy sand.	SC, ML, CL, SC-SM	A-4, A-6, A-2	0	80-100	70-100	40-80	15-55	0-35	NP-15
Lily	0-8	Loam	ML, CL-ML	A-4	0-5	90-100	80-100	70-95	55-80	<35	NP-10
	8-15	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	80-100	75-100	40-80	<35	3-15
	15-24	Sandy clay loam, clay loam, gravelly sandy clay loam.	SM, SC, ML, CL	A-4, A-2, A-6, A-1-B	0-10	65-100	50-100	40-95	20-75	<35	3-15
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rf	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-40	5-15
Robbs	8-22	Silty clay loam, silt loam.	CL, ML, CL-ML	A-7, A-6	0	100	100	100	95-100	25-40	10-20
	22-72	Silty clay loam, silt loam.	CL, ML, CL-ML	A-7, A-6	0	100	100	95-100	90-100	25-50	10-35
RkF*:											
Rock outcrop.											
Caneyville	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	75-100	60-95	20-35	2-12
	6-10	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	10-24	Clay, silty clay	CH	A-7	0-10	90-100	85-100	75-100	65-100	50-75	30-45
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RmD*:											
Rock outcrop.											
Corydon	0-9	Silt loam	CL, CL-ML	A-4, A-6	0-2	85-100	80-100	75-95	60-85	25-35	5-15
	9-19	Silty clay loam, clay, silty clay.	CL, CH	A-6, A-7	0-2	85-95	85-95	80-95	70-90	35-60	20-35
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RnC2	0-7	Silt loam	ML, CL, CL-ML	A-4	0-5	95-100	90-100	85-100	70-95	20-30	3-10
Rosine	7-21	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	21-54	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0-30	75-100	75-100	75-95	60-90	35-60	20-40
	54-64	Channery silty clay loam, channery silty clay, channery clay.	CH, CL	A-7, A-6	10-40	65-90	55-90	55-90	50-70	35-60	20-40
	64	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
RoC3----------	0-6	Silty clay loam	CL	A-6	0-5	95-100	90-100	85-100	75-95	25-35	11-20
Rosine	6-16	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	16-49	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0-30	75-100	75-100	75-95	60-90	35-60	20-40
	49-61	Channery silty clay loam, channery silty clay, channery clay.	CH, CL	A-7, A-6	10-40	65-90	55-90	55-90	50-70	35-60	20-40
	61	Weathered bedrock	---	---	---	---	---	---	---	---	---
RsD2*:											
Rosine----------	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0-5	95-100	90-100	85-100	70-95	20-30	3-10
	7-21	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	21-54	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0-30	75-100	75-100	75-95	60-90	35-60	20-40
	54-64	Channery silty clay loam, channery silty clay, channery clay.	CH, CL	A-7, A-6	10-40	65-90	55-90	55-90	50-70	35-60	20-40
	64	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gilpin----------	0-10	Loam----------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	10-24	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-29	Channery loam, very channery silt loam, very channery loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lenberg----------	0-3	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0-5	80-100	80-100	75-95	65-90	20-45	2-22
	3-15	Silty clay loam, silty clay, gravelly clay.	CL, CH	A-6, A-7	0-5	75-100	60-100	55-95	50-90	35-70	15-40
	15-31	Silty clay, clay, gravelly clay.	CL, CH, ML, MH	A-7	0-5	75-100	55-100	54-95	50-90	45-70	19-40
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
RsD3*:											
Rosine----------	0-4	Silt loam--------	ML, CL, CL-ML	A-4	0-5	95-100	90-100	85-100	70-95	20-30	3-10
	4-16	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	16-49	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0-30	75-100	75-100	75-95	60-90	35-60	20-40
	49-61	Channery silty clay loam, channery silty clay, channery clay.	CH, CL	A-7, A-6	10-40	65-90	55-90	55-90	50-70	35-60	20-40
	61	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gilpin----------	0-4	Loam----------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	4-18	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	18-23	Channery loam, very channery silt loam, very channery loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lenberg----------	0-4	Silty clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0-5	80-100	80-100	75-95	65-90	20-45	2-22
	4-12	Silty clay loam, silty clay, gravelly clay.	CL, CH	A-6, A-7	0-5	75-100	60-100	55-95	50-90	35-70	15-40
	12-28	Silty clay, clay, gravelly clay.	CL, CH, ML, MH	A-7	0-5	75-100	55-100	54-95	50-90	45-70	19-40
	28	Weathered bedrock	---	---	---	---	---	---	---	---	---
RsE*:											
Rosine----------	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0-5	95-100	90-100	85-100	70-95	20-30	3-10
	7-21	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	21-54	Silty clay, silty clay loam, clay.	CL, CH	A-6, A-7	0-30	75-100	75-100	75-95	60-90	35-60	20-40
	54-64	Channery silty clay loam, channery silty clay, channery clay.	CH, CL	A-7, A-6	10-40	65-90	55-90	55-90	50-70	35-60	20-40
	64	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
RsE*:											
Gilpin	0-10	Loam	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	10-24	Loam, channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-29	Channery loam, very channery loam, very channery silt loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lenberg	0-3	Silt loam	ML, CL, CL-ML	A-4, A-6, A-7	0-5	80-100	80-100	75-95	65-90	20-45	2-22
	3-15	Silty clay loam, silty clay, gravelly clay.	CL, CH	A-6, A-7	0-5	75-100	60-100	55-95	50-90	35-70	15-40
	15-31	Silty clay, clay, gravelly clay.	CL, CH, ML, MH	A-7	0-5	75-100	55-100	54-95	50-90	45-70	19-40
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
SaA Sadler	0-8	Silt loam	ML, CL-ML	A-4	0	95-100	95-100	85-100	80-100	25-35	4-10
	8-28	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-20
	28-61	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0-10	85-100	80-100	70-100	55-95	20-40	2-20
	61-78	Loam, silty clay loam, gravelly loam, very gravelly fine sandy loam.	ML, CL, SM, GM, GM-GC	A-4, A-6, A-2	0-20	65-100	60-95	50-95	35-90	20-50	2-30
SaB2 Sadler	0-8	Silt loam	ML, CL-ML	A-4	0	95-100	95-100	85-100	80-100	25-35	4-10
	8-26	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-20
	26-59	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0-10	85-100	80-100	70-100	55-95	20-40	2-20
	59-76	Loam, silty clay loam, gravelly loam, very gravelly fine sandy loam.	ML, CL, SM, GM, GM-GC	A-4, A-6, A-2	0-20	65-100	60-95	50-95	35-90	20-50	2-30
ScA, ScB Sciotoville	0-14	Silt loam	CL-ML, ML	A-4	0	95-100	95-100	90-100	65-95	25-35	4-10
	14-28	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	70-90	20-35	4-15
	28-53	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0-5	95-100	90-100	85-100	65-90	25-40	4-18
	53-75	Stratified silty clay loam to sandy loam.	ML, CL, SM, SC	A-4, A-6	0-15	75-100	75-100	65-100	45-70	5-35	NP-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Sf	0-8	Silt loam	ML	A-4	0	95-100	90-100	80-100	55-95	<35	NP-10
Steff	8-49	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	70-95	20-40	3-20
	49-63	Silt loam, gravelly loam, very fine sandy loam.	ML, CL-ML, SM, GM	A-4, A-2, A-1	0-10	50-100	40-100	35-95	20-90	<35	NP-10
St	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-90	25-40	5-15
Stendal	8-64	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-90	25-40	5-15
VrF*:											
Varilla	0-6	Stony sandy loam	SM, GM, SC-SM, GM-GC	A-2, A-4, A-6	0-10	60-85	60-85	50-80	25-50	<30	NP-15
	6-24	Very channery sandy loam, very channery loam.	SM, SC, SC-SM	A-2, A-4, A-6	20-40	70-90	70-90	50-80	25-50	<30	NP-15
	24-62	Extremely channery sandy loam, extremely channery loamy sand, extremely channery fine sandy loam.	GM, GM-GC, SM, SC-SM	A-2	30-50	60-80	55-80	50-70	10-35	<25	NP-10
Gilpin	0-10	Loam	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	10-24	Channery loam, channery silt loam, channery silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-29	Channery loam, very channery silt loam, very channery silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
W*											
Water											
We	0-17	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-90	20-40	5-15
Weinbach	17-27	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	70-90	25-35	8-15
	27-45	Silt loam, silty clay loam, clay loam.	CL	A-4, A-6, A-7	0	100	100	90-100	70-90	25-42	8-20
	45-56	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	15-25
	56-65	Stratified silty clay loam to fine sand.	CL, ML, SM, SC	A-6, A-7, A-2, A-4	0	100	100	90-100	20-95	25-45	NP-20

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
WtF*:											
Westmoreland----	0-6	Silt loam--------	ML, CL	A-4, A-6	0-5	85-100	80-100	75-95	60-95	<35	NP-10
	6-40	Silty clay loam, silt loam, channery silt loam.	CL, ML, GM, GC	A-4, A-6, A-7	0-15	65-100	55-95	50-90	45-85	22-45	2-20
	40-48	Very channery loam, channery silt loam, channery silty clay loam.	GM, GC, SM, SC	A-2, A-1, A-4, A-6	0-20	25-95	20-95	15-90	15-80	20-40	2-20
	48	Weathered bedrock	---	---	---	---	---	---	---	---	---
Caneyville------	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	75-100	60-95	20-35	2-12
	6-10	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	10-24	Clay, silty clay	CH	A-7	0-10	90-100	85-100	75-100	65-100	50-75	30-45
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
WxB---------- Wheeling	0-15	Fine sandy loam	SM, SC-SM, SC	A-2, A-4	0	90-100	90-100	60-80	30-50	10-25	NP-10
	15-50	Silty clay loam, loam, gravelly sandy loam.	ML, CL, SM, SC	A-4, A-6	0-5	90-100	70-100	65-100	45-80	20-40	2-20
	50-77	Stratified very fine sand to very gravelly sand.	GM, SM, GP, GW	A-1, A-2, A-3, A-4	10-20	35-90	20-75	10-65	4-45	<20	NP-10
WxC2---------- Wheeling	0-8	Fine sandy loam	SM, SC-SM, SC	A-2, A-4	0	90-100	90-100	60-80	30-50	10-25	NP-10
	8-45	Silty clay loam, loam, gravelly sandy loam.	ML, CL, SM, SC	A-4, A-6	0-5	90-100	70-100	65-100	45-80	20-40	2-20
	45-72	Stratified very fine sand to very gravelly sand.	GM, SM, GP, GW	A-1, A-2, A-3, A-4	10-20	35-90	20-75	10-65	4-45	<20	NP-10
Ya---------- Yeager	0-9	Loamy sand-------	SM, SP-SM	A-2-4, A-3	0	95-100	75-100	55-80	5-35	<20	NP
	9-41	Stratified loamy sand.	SP-SM, SM	A-2-4, A-3	0	95-100	75-100	55-80	5-35	<20	NP
	41-67	Loam, sandy loam, gravelly loamy sand, sand.	SP-SM, SM	A-2-4, A-1, A-3	0-5	85-100	40-100	40-80	5-35	<20	NP

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
ZaB2, ZaC2--- Zanesville	0-9	Silt loam---	CL-ML, CL, ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	4-15
	9-23	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	5-20
	23-55	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	80-100	60-100	20-40	2-20
	55-59	Silty clay loam, silt loam, channery loam.	SC, CL, SM, GM	A-6, A-4, A-2, A-1-B	0-10	65-100	50-100	40-100	20-85	20-40	2-20
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
ZnC3--- Zanesville	0-4	Silty clay loam	CL	A-6	0	95-100	95-100	90-100	80-100	30-40	10-20
	4-19	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	5-20
	19-51	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	80-100	60-100	20-40	2-20
	51-55	Silty clay loam, silt loam, channery loam.	SC, CL, SM, GM	A-6, A-4, A-2, A-1-B	0-10	65-100	50-100	40-100	20-85	20-40	2-20
	55	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AlB2, AlC2, AlD2-	0-9	12-26	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	1-3
Alford	9-72	22-32	1.35-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Low	0.37		
BaB2, BaC2, BaD2,										
BaE2	0-5	12-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-6.5	Low	0.28	5	1-3
Baxter	5-11	18-40	1.30-1.55	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.24		
	11-37	40-60	1.30-1.55	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24		
	37-97	40-60	1.35-1.65	0.6-2.0	0.08-0.13	4.5-5.5	Moderate	0.24		
BbC3, BbD3, BeC4,										
BeD4	0-6	27-35	1.20-1.45	0.6-2.0	0.12-0.18	4.5-6.5	Low	0.24	5	.5-2
Baxter	6-30	40-60	1.30-1.55	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24		
	30-90	40-60	1.35-1.65	0.6-2.0	0.08-0.13	4.5-5.5	Moderate	0.24		
CaC2, CaD2	0-6	10-25	1.20-1.40	0.6-2.0	0.15-0.22	4.5-7.3	Low	0.43	3	2-4
Caneyville	6-10	36-60	1.35-1.60	0.2-0.6	0.12-0.18	4.5-7.3	Moderate	0.28		
	10-24	40-60	1.35-1.60	0.2-0.6	0.12-0.18	5.6-7.8	Moderate	0.28		
	24	---	---	---	---	---				
CeC3, CeD3	0-5	40-60	1.30-1.55	0.2-0.6	0.13-0.18	4.5-7.3	Moderate	0.32	2	.5-2
Caneyville	5-23	36-60	1.35-1.60	0.2-0.6	0.12-0.18	5.6-7.8	Moderate	0.28		
	23	---	---	---	---	---				
CkD*:										
Caneyville	0-6	10-25	1.20-1.40	0.6-2.0	0.15-0.22	4.5-7.3	Low	0.43	3	2-4
	6-10	36-60	1.35-1.60	0.2-0.6	0.12-0.18	4.5-7.3	Moderate	0.28		
	10-24	40-60	1.35-1.60	0.2-0.6	0.12-0.18	5.6-7.8	Moderate	0.28		
	24	---	---	---	---	---				
Rock outcrop.										
Cn	0-9	8-20	1.20-1.40	0.6-2.0	0.13-0.18	5.6-7.3	Low	0.32	5	2-4
Chagrin	9-37	18-30	1.20-1.50	0.6-2.0	0.14-0.20	5.6-7.3	Low	0.32		
	37-63	5-25	1.20-1.40	0.6-2.0	0.08-0.20	5.6-7.3	Low	0.32		
Co	0-8	12-27	1.20-1.40	2.0-6.0	0.10-0.18	4.5-6.5	Low	0.28	5	2-4
Clifty	8-34	18-35	1.20-1.45	2.0-6.0	0.08-0.16	4.5-5.5	Low	0.28		
	34-64	12-35	1.20-1.45	2.0-20	0.05-0.12	4.5-5.5	Low	0.28		
CrB2, CrC2, CrD2-	0-7	15-27	1.20-1.40	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	5	2-4
Crider	7-31	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.1-7.3	Low	0.28		
	31-80	30-60	1.20-1.55	0.6-2.0	0.12-0.18	4.5-6.0	Moderate	0.28		
CtC3, CtD3	0-6	27-35	1.20-1.40	0.6-2.0	0.18-0.23	5.1-7.3	Low	0.32	5	.5-2
Crider	6-26	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.1-7.3	Low	0.28		
	26-75	30-60	1.20-1.55	0.6-2.0	0.12-0.18	5.1-6.0	Moderate	0.28		
Cu	0-30	18-25	1.30-1.45	0.6-2.0	0.22-0.24	4.5-5.5	Low	0.37	5	3-5
Cuba	30-66	14-20	1.45-1.65	0.6-2.0	0.19-0.21	4.5-5.5	Low	0.37		
EkA, EkB	0-8	10-27	1.20-1.40	0.6-2.0	0.19-0.23	4.5-6.5	Low	0.37	5	3-5
Elk	8-51	18-34	1.20-1.50	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.28		
	51-76	15-40	1.20-1.50	0.6-2.0	0.14-0.20	4.5-6.5	Low	0.28		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
EkC2, EkD2------- Elk	0-8 8-48 48-75	10-27 18-34 15-40	1.20-1.40 1.20-1.50 1.20-1.50	0.6-2.0 0.6-2.0 0.6-2.0	0.19-0.23 0.18-0.22 0.14-0.20	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.37 0.28 0.28	5	2-4
EkD3------------- Elk	0-7 7-45 45-70	10-27 18-34 15-40	1.20-1.40 1.20-1.50 1.20-1.50	0.6-2.0 0.6-2.0 0.6-2.0	0.19-0.23 0.18-0.22 0.14-0.20	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.37 0.28 0.28	5	.5-2
EkE-------------- Elk	0-8 8-51 51-76	10-27 18-34 15-40	1.20-1.40 1.20-1.50 1.20-1.50	0.6-2.0 0.6-2.0 0.6-2.0	0.19-0.23 0.18-0.22 0.14-0.20	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.37 0.28 0.28	5	3-5
FcC2*, FcD2*: Fredonia-------- Crider---------- FrD3*: Fredonia-------- Crider---------- GaB2------------- Gatton GlC2------------- Gilpin GlC3------------- Gilpin GwF*: Gilpin---------- Dekalb---------- Rock outcrop.	0-4 4-30 30 0-7 7-31 31-80 0-3 3-27 27 0-6 6-26 26-75 0-6 6-20 20-34 34-72 0-5 5-24 24-29 29 0-3 3-19 19-24 24 0-10 10-24 24-29 29 0-5 5-28 28-38 38	18-27 40-60 --- 15-27 18-35 30-60 27-40 40-60 --- 27-35 18-35 30-60 15-27 18-35 15-35 30-50 15-27 18-35 15-35 --- 15-27 18-35 15-35 --- 15-27 18-35 15-35 --- 10-20 7-18 5-15 ---	1.30-1.50 1.30-1.60 --- 1.20-1.40 1.20-1.45 1.20-1.55 1.30-1.50 1.30-1.60 --- 1.20-1.40 1.20-1.45 1.20-1.55 1.20-1.40 1.25-1.40 1.50-1.70 1.45-1.65 1.20-1.40 1.20-1.50 1.20-1.50 --- 1.20-1.40 1.20-1.50 1.20-1.50 --- 1.20-1.40 1.20-1.50 1.20-1.50 --- 1.20-1.50 1.20-1.50 1.20-1.50 ---	0.6-2.0 0.06-0.6 --- 0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0 0.06-0.6 --- 0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0 0.06-0.2 0.6-2.0 0.6-2.0 0.6-2.0 0.6-2.0 --- 0.6-2.0 0.6-2.0 0.6-2.0 --- 0.6-2.0 0.6-2.0 0.6-2.0 --- 6.0-20 6.0-20 >6.0 ---	0.18-0.22 0.13-0.18 --- 0.19-0.23 0.18-0.23 0.12-0.18 0.18-0.22 0.13-0.18 --- 0.18-0.23 0.18-0.23 0.12-0.18 0.19-0.23 0.18-0.23 0.06-0.9 0.13-0.18 0.12-0.18 0.12-0.16 0.08-0.12 --- 0.12-0.18 0.12-0.16 0.08-0.12 --- 0.12-0.18 0.12-0.16 0.08-0.12 --- 0.08-0.12 0.06-0.12 0.05-0.10 ---	5.1-6.5 5.1-7.3 --- 5.1-7.3 5.1-7.3 4.5-6.5 5.1-6.5 5.1-7.3 --- 5.1-7.3 5.1-7.3 4.5-6.5 4.5-7.3 4.5-5.5 4.5-5.5 4.5-5.5 3.6-5.5 3.6-5.5 3.6-5.5 --- 3.6-5.5 3.6-5.5 3.6-5.5 --- 3.6-5.5 3.6-5.5 3.6-5.5 --- 3.6-6.5 3.6-5.5 3.6-5.5 ---	Low---------- Moderate----- ---------- Low---------- Low---------- Moderate----- Low---------- Moderate----- ---------- Low---------- Low---------- Moderate----- Low---------- Low---------- Low---------- Moderate----- Low---------- Low---------- Low---------- ---------- Low---------- Low---------- Low---------- ---------- Low---------- Low---------- Low---------- ----------	0.37 0.28 ---- 0.32 0.28 0.28 0.37 0.28 ---- 0.32 0.28 0.28 0.37 0.43 0.37 0.28 0.32 0.24 0.24 ---- 0.32 0.24 0.24 ---- 0.32 0.24 0.24 ---- 0.17 0.17 0.17 ----	3 5 3 5 3 3 3 2	2-4 2-4 .5-2 .5-2 2-4 2-4

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
HaB2	0-9	12-27	1.20-1.40	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.37	4	2-4
Hammack	9-27	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32		
	27-40	18-35	1.20-1.45	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24		
	40-86	40-60	1.35-1.65	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24		
HbC2*:										
Hammack	0-9	12-27	1.20-1.40	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.37	4	2-4
	9-27	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32		
	27-40	18-35	1.20-1.45	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24		
	40-86	40-60	1.35-1.65	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24		
Baxter	0-5	12-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-6.5	Low	0.28	5	2-4
	5-11	18-40	1.30-1.55	0.6-2.0	0.14-0.18	4.5-6.5	Moderate	0.24		
	11-37	40-60	1.30-1.55	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24		
	37-97	40-60	1.35-1.65	0.6-2.0	0.08-0.13	4.5-5.5	Moderate	0.24		
HbC3*:										
Hammack	0-5	27-35	1.20-1.40	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.32	4	.5-2
	5-23	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32		
	23-36	18-35	1.20-1.45	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24		
	36-82	40-60	1.35-1.65	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24		
Baxter	0-6	27-35	1.20-1.45	0.6-2.0	0.12-0.18	4.5-6.5	Low	0.24	5	.5-2
	6-30	18-40	1.30-1.55	0.6-2.0	0.14-0.18	4.5-6.5	Moderate	0.24		
	30-90	40-60	1.30-1.55	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24		
HoB2, HoC2	0-9	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low	0.43	3	2-4
Hosmer	9-25	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.43		
	25-70	16-26	1.60-1.70	0.06-0.2	0.06-0.08	4.5-6.0	Low	0.43		
Hu	0-15	18-27	1.10-1.30	0.6-2.0	0.18-0.24	5.6-7.8	Low	0.28	5	4-6
Huntington	15-46	18-30	1.30-1.50	0.6-2.0	0.16-0.22	5.6-7.8	Low	0.32		
	46-70	15-30	1.30-1.50	0.6-2.0	0.10-0.16	5.6-7.8	Low	0.28		
LaB, LaC	0-11	2-6	1.20-1.40	6.0-20	0.06-0.10	4.5-6.0	Low	0.17	5	1-2
Lakin	11-65	3-8	1.30-1.50	6.0-20	0.04-0.08	4.5-6.0	Low	0.17		
Ld, Ln	0-8	15-27	1.20-1.40	0.6-2.0	0.20-0.26	5.1-7.8	Low	0.32	5	2-4
Lindside	8-49	18-35	1.20-1.40	0.6-2.0	0.17-0.22	5.1-7.8	Low	0.37		
	49-65	18-35	1.20-1.40	0.2-6.0	0.12-0.18	5.6-7.8	Low	0.32		
MaC3, MaD3	0-2	28-40	1.35-1.50	0.2-0.6	0.18-0.20	5.1-7.3	Moderate	0.43	2	1-2
Markland	2-36	40-55	1.55-1.65	0.06-0.2	0.11-0.13	5.1-7.3	High	0.32		
	36-67	35-50	1.55-1.70	0.06-0.2	0.09-0.11	7.4-8.4	High	0.32		
Mc	0-7	22-27	1.35-1.50	0.6-2.0	0.22-0.24	6.1-7.3	Low	0.43	3	1-4
McGary	7-64	35-50	1.60-1.70	0.06-0.2	0.11-0.13	5.6-7.8	High	0.32		
Me, Mf	0-7	12-17	1.20-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43	5	2-4
Melvin	7-65	12-35	1.30-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43		
Na, Ne	0-9	7-27	1.20-1.40	0.6-2.0	0.15-0.23	5.6-7.8	Low	0.43	5	2-4
Newark	9-30	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43		
	30-68	12-40	1.30-1.50	0.6-2.0	0.15-0.22	5.6-7.8	Low	0.43		
NhB2, NhC2	0-8	12-27	1.20-1.40	0.6-2.0	0.19-0.23	4.5-6.5	Low	0.43	3	2-4
Nicholson	8-23	18-35	1.40-1.60	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43		
	23-43	18-35	1.50-1.70	0.06-0.2	0.07-0.12	4.5-6.5	Low	0.43		
	43-70	35-60	1.40-1.60	0.06-0.6	0.07-0.12	5.1-7.8	Moderate	0.37		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
NkC4	0-6	12-27	1.20-1.40	0.6-2.0	0.19-0.23	4.5-6.5	Low	0.43	3	.5-2
Nicholson	6-18	18-35	1.40-1.60	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43		
	18-38	18-35	1.50-1.70	0.06-0.2	0.07-0.12	4.5-6.5	Low	0.43		
	38-68	35-60	1.40-1.60	0.06-0.6	0.07-0.12	5.1-7.8	Moderate	0.37		
No, Nv	0-8	12-27	1.20-1.40	0.6-2.0	0.18-0.23	5.6-8.4	Low	0.43	5	3-5
Nolin	8-62	18-35	1.25-1.50	0.6-2.0	0.18-0.23	5.6-8.4	Low	0.43		
	62-72	10-30	1.30-1.55	0.6-6.0	0.10-0.23	5.1-8.4	Low	0.43		
PeA, PeB	0-10	15-26	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.43	3	2-4
Pekin	10-26	25-35	1.40-1.60	0.6-2.0	0.20-0.22	4.5-6.5	Low	0.43		
	26-50	22-30	1.60-1.80	0.06-0.2	0.06-0.08	4.5-6.5	Low	0.43		
	50-64	20-34	1.40-1.60	0.6-2.0	0.06-0.08	4.5-7.3	Low	0.43		
Pt*.										
Pits, quarries										
RaC2	0-8	10-25	1.20-1.40	2.0-6.0	0.12-0.18	4.5-7.3	Low	0.28	4	1-3
Riney	8-50	20-35	1.20-1.50	2.0-6.0	0.13-0.17	4.5-5.5	Low	0.28		
	50-62	10-35	1.20-1.50	2.0-6.0	0.05-0.14	4.5-5.5	Low	0.28		
ReD*, ReE*:										
Riney	0-8	10-25	1.20-1.40	2.0-6.0	0.12-0.18	4.5-7.3	Low	0.28	4	1-3
	8-50	20-35	1.20-1.50	2.0-6.0	0.13-0.17	4.5-5.5	Low	0.28		
	50-62	10-35	1.20-1.50	2.0-6.0	0.05-0.14	4.5-5.5	Low	0.28		
Lily	0-8	7-27	1.20-1.40	0.6-6.0	0.13-0.18	3.6-5.5	Low	0.28	2	.5-2
	8-15	18-35	1.25-1.35	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28		
	15-24	20-35	1.25-1.35	2.0-6.0	0.08-0.17	3.6-5.5	Low	0.17		
	24	---	---	---	---	---	---	---		
Rf	0-8	15-27	1.20-1.40	0.6-2.0	0.21-0.24	4.5-6.0	Low	0.43	3	2-4
Robbs	8-22	27-35	1.30-1.55	0.6-2.0	0.18-0.20	4.5-6.0	Low	0.43		
	22-72	22-35	1.70-1.85	0.06-0.2	0.09-0.11	4.5-5.5	Low	0.43		
RkF*:										
Rock outcrop.										
Caneyville	0-6	10-27	1.20-1.40	0.6-2.0	0.15-0.22	4.5-7.3	Low	0.43	3	2-4
	6-10	36-60	1.35-1.60	0.2-0.6	0.12-0.18	4.5-7.3	Moderate	0.28		
	10-24	40-60	1.35-1.60	0.2-0.6	0.12-0.18	5.6-7.8	Moderate	0.28		
	24	---	---	---	---	---	---	---		
RmD*:										
Rock outcrop.										
Corydon	0-9	20-27	1.25-1.40	0.6-2.0	0.20-0.22	6.1-7.3	Low	0.32	2	2-4
	9-19	35-50	1.35-1.60	0.2-0.6	0.11-0.20	5.6-7.3	Moderate	0.32		
	19	---	---	---	---	---	---	---		
RnC2	0-7	13-27	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.49	4	2-5
Rosine	7-21	22-35	1.35-1.65	0.6-2.0	0.17-0.21	4.5-5.5	Low	0.37		
	21-54	30-50	1.40-1.65	0.2-0.6	0.11-0.18	4.5-5.5	Moderate	0.37		
	54-64	30-50	1.40-1.65	0.2-0.6	0.10-0.16	4.5-6.5	Moderate	0.28		
	64	---	---	---	---	---	---	---		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
RoC3----------	0-6	27-35	1.35-1.55	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37	3	.5-3
Rosine	6-16	22-35	1.35-1.65	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37		
	16-49	30-50	1.40-1.65	0.2-0.6	0.11-0.18	4.5-5.5	Moderate-----	0.37		
	49-61	30-50	1.40-1.65	0.2-0.6	0.10-0.16	4.5-6.5	Moderate-----	0.28		
	61	---	---	---	---	---	----------	----		
RsD2*:										
Rosine----------	0-7	13-27	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.49	4	2-5
	7-21	22-35	1.35-1.65	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37		
	21-54	30-50	1.40-1.65	0.2-0.6	0.11-0.18	4.5-5.5	Moderate-----	0.37		
	54-64	30-50	1.40-1.65	0.2-0.6	0.10-0.16	4.5-6.5	Moderate-----	0.28		
	64	---	---	---	---	---	----------	----		
Gilpin----------	0-10	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.32	3	2-4
	10-24	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	24-29	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.24		
	29	---	---	---	---	---	----------	----		
Lenberg----------	0-3	12-27	1.30-1.50	0.6-2.0	0.18-0.23	4.5-7.3	Low----------	0.43	3	2-4
	3-15	35-60	1.40-1.60	0.2-0.6	0.10-0.19	4.5-5.5	Moderate-----	0.37		
	15-31	40-60	1.40-1.65	0.2-0.6	0.10-0.18	4.5-5.5	Moderate-----	0.37		
	31	---	---	---	---	---	----------	----		
RsD3*:										
Rosine----------	0-4	13-27	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.49	4	.5-2
	4-16	22-35	1.35-1.65	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37		
	16-49	30-50	1.40-1.65	0.2-0.6	0.11-0.18	4.5-5.5	Moderate-----	0.37		
	49-61	30-50	1.40-1.65	0.2-0.6	0.10-0.16	4.5-6.5	Moderate-----	0.28		
	61	---	---	---	---	---	----------	----		
Gilpin----------	0-4	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.32	3	.5-2
	4-18	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	18-23	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.24		
	23	---	---	---	---	---	----------	----		
Lenberg----------	0-4	27-35	1.30-1.50	0.6-2.0	0.18-0.23	4.5-7.3	Low----------	0.43	3	.5-2
	4-12	35-60	1.40-1.60	0.2-0.6	0.10-0.19	4.5-5.5	Moderate-----	0.37		
	12-28	40-60	1.40-1.65	0.2-0.6	0.10-0.18	4.5-5.5	Moderate-----	0.37		
	28	---	---	---	---	---	----------	----		
RsE*:										
Rosine----------	0-7	13-27	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.49	4	2-4
	7-21	22-35	1.35-1.65	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37		
	21-54	30-50	1.40-1.65	0.2-0.6	0.11-0.18	4.5-5.5	Moderate-----	0.37		
	54-64	30-50	1.40-1.65	0.2-0.6	0.10-0.16	4.5-6.5	Moderate-----	0.28		
	64	---	---	---	---	---	----------	----		
Gilpin----------	0-10	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.32	3	2-4
	10-24	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	24-29	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.24		
	29	---	---	---	---	---	----------	----		
Lenberg----------	0-3	12-27	1.30-1.50	0.6-2.0	0.18-0.23	4.5-7.3	Low----------	0.43	3	2-4
	3-15	35-60	1.40-1.60	0.2-0.6	0.10-0.19	4.5-5.5	Moderate-----	0.37		
	15-31	40-60	1.40-1.65	0.2-0.6	0.10-0.18	4.5-5.5	Moderate-----	0.37		
	31	---	---	---	---	---	----------	----		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
SaA----------	0-8	12-27	1.30-1.50	0.6-2.0	0.19-0.23	4.5-7.3	Low----------	0.43	3	2-4
Sadler	8-28	18-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.43		
	28-61	12-35	1.55-1.75	0.06-0.2	0.07-0.12	4.5-5.5	Low----------	0.43		
	61-78	12-40	1.50-1.70	0.2-2.0	0.07-0.12	4.5-5.5	Low----------	0.43		
SaB2---------	0-8	12-27	1.30-1.50	0.6-2.0	0.19-0.23	4.5-7.3	Low----------	0.43	3	1-3
Sadler	8-26	18-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.43		
	26-59	12-35	1.55-1.75	0.06-0.2	0.07-0.12	4.5-5.5	Low----------	0.43		
	59-76	12-40	1.50-1.70	0.2-2.0	0.07-0.12	4.5-5.5	Low----------	0.43		
ScA, ScB---------	0-14	15-27	1.30-1.45	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.37	3	2-4
Sciotoville	14-28	20-32	1.40-1.60	0.6-2.0	0.17-0.21	4.5-5.5	Low----------	0.37		
	28-53	20-32	1.60-1.80	0.06-0.2	0.10-0.14	4.5-6.0	Low----------	0.37		
	53-75	15-35	1.50-1.65	2.0-6.0	0.10-0.14	5.1-6.5	Low----------	0.37		
Sf----------	0-8	12-25	1.30-1.50	0.6-2.0	0.15-0.23	4.5-7.3	Low----------	0.43	5	2-4
Steff	8-49	12-34	1.30-1.55	0.6-2.0	0.18-0.23	4.5-5.5	Low----------	0.43		
	49-63	10-25	1.40-1.65	0.6-6.0	0.08-0.21	4.5-5.5	Low----------	0.43		
St----------	0-8	18-27	1.30-1.45	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.37	5	2-4
Stendal	8-64	18-35	1.45-1.65	0.6-2.0	0.20-0.22	4.5-6.5	Low----------	0.37		
VrF*:										
Varilla---------	0-6	3-20	1.00-1.40	2.0-6.0	0.10-0.13	3.6-6.5	Low----------	0.20	5	2-6
	6-24	3-20	1.45-1.65	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.10		
	24-62	3-20	1.45-1.65	2.0-20	0.01-0.05	3.6-5.5	Low----------	0.10		
Gilpin----------	0-10	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.32	3	2-4
	10-24	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	24-29	15-35	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.24		
	29	---	---	---	---	---	----------	----		
Rock outcrop.										
W*										
Water										
We----------	0-17	18-27	1.30-1.45	0.6-2.0	0.20-0.24	4.5-7.3	Low----------	0.43	3	2-4
Weinbach	17-27	20-30	1.40-1.60	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43		
	27-45	20-30	1.60-1.80	0.06-0.2	0.06-0.08	4.5-5.5	Low----------	0.43		
	45-56	22-35	1.60-1.80	0.2-0.6	0.14-0.18	4.5-5.5	Low----------	0.43		
	56-65	15-35	1.50-1.65	0.2-0.6	0.19-0.21	4.5-6.0	Low----------	0.43		
WtF*:										
Westmoreland----	0-6	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low----------	0.37	3	2-4
	6-40	20-35	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.28		
	40-48	18-35	1.20-1.50	0.6-2.0	0.06-0.10	5.1-6.0	Low----------	0.17		
	48	---	---	---	---	---	----------	----		
Caneyville------	0-6	10-27	1.20-1.40	0.6-2.0	0.15-0.22	4.5-7.3	Low----------	0.43	3	2-4
	6-10	36-60	1.35-1.60	0.2-0.6	0.12-0.18	4.5-7.3	Moderate-----	0.28		
	10-24	40-60	1.35-1.60	0.2-0.6	0.12-0.18	5.6-7.8	Moderate-----	0.28		
	24	---	---	---	---	---	----------	----		
Rock outcrop.										
WxB----------	0-15	10-20	1.55-1.75	0.6-6.0	0.12-0.16	5.1-6.5	Low----------	0.28	4	2-4
Wheeling	15-50	18-30	1.30-1.50	0.6-2.0	0.08-0.16	5.1-6.0	Low----------	0.32		
	50-77	8-15	1.30-1.50	6.0-20	0.04-0.08	5.1-6.0	Low----------	0.20		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
WxC2	0-8	10-20	1.55-1.75	0.6-6.0	0.12-0.16	5.1-6.5	Low	0.28	4	1-3
Wheeling	8-45	18-30	1.30-1.50	0.6-2.0	0.08-0.16	5.1-6.0	Low	0.32		
	45-72	8-15	1.30-1.50	6.0-20	0.04-0.08	5.1-6.0	Low	0.20		
Ya	0-9	1-8	1.40-1.70	6.0-20	0.05-0.10	4.5-7.3	Low	0.15	5	1-3
Yeager	9-41	2-10	1.40-1.70	2.0-20	0.05-0.10	4.5-7.3	Low	0.15		
	41-67	2-18	1.40-1.70	2.0-20	0.05-0.10	4.5-7.3	Low	0.15		
ZaB2, ZaC2	0-9	12-27	1.35-1.40	0.6-2.0	0.19-0.23	4.5-6.0	Low	0.43	3	2-4
Zanesville	9-23	18-35	1.35-1.45	0.6-2.0	0.17-0.22	4.5-6.0	Low	0.37		
	23-55	18-33	1.50-1.75	0.06-0.2	0.08-0.12	4.5-6.0	Low	0.37		
	55-59	20-40	1.50-1.70	0.2-2.0	0.08-0.12	4.5-6.0	Low	0.28		
	59	---	---	---	---	---	---	----		
ZnC3	0-4	27-35	1.35-1.40	0.6-2.0	0.18-0.23	4.5-6.0	Low	0.37	3	.5-2
Zanesville	4-19	18-35	1.35-1.45	0.6-2.0	0.17-0.22	4.5-6.0	Low	0.37		
	19-51	18-33	1.50-1.75	0.06-0.2	0.08-0.12	4.5-6.0	Low	0.37		
	51-55	20-40	1.50-1.70	0.2-2.0	0.08-0.12	4.5-6.0	Low	0.28		
	55	---	---	---	---	---	---	----		

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AlB2, AlC2, AlD2-- Alford	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
BaB2, BaC2, BaD2, BaE2, BbC3, BbD3, BeC4, BeD4 Baxter	B	None	---	---	>6.0	---	---	>60	---	High	High.
CaC2, CaD2, CeC3, CeD3 Caneyville	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
CkD*: Caneyville	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Rock outcrop.											
Cn Chagrin	B	Occasional	Brief	Dec-May	4.0-6.0	Apparent	Feb-Mar	>60	---	Low	Moderate.
Co Clifty	B	Occasional	Brief	Dec-May	>6.0	---	---	>60	---	Low	High.
CrB2, CrC2, CrD2, CtC3, CtD3 Crider	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Cu Cuba	B	Occasional	Brief	Dec-May	>6.0	---	---	>60	---	Low	High.
EkA, EkB, EkC2 Elk	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
EkD2, EkD3, EkE Elk	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
FcC2*, FcD2*, FrD3*: Fredonia	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Crider	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
GaB2 Gatton	B	None	---	---	1.5-2.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
GlC2, GlC3 Gilpin	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
GwF*: Gilpin	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
Dekalb	C	None	---	---	>6.0	---	---	20-40	Hard	Low	High.
Rock outcrop.											

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
HaB2---------- Hammack	B	None------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
HbC2*, HbC3*: Hammack----------	B	None------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Baxter----------	B	None------	---	---	>6.0	---	---	>60	---	High----	High.
HoB2, HoC2-------- Hosmer	C	None------	---	---	2.0-3.0	Perched	Jan-Apr	>60	---	Moderate	High.
Hu---------- Huntington	B	Occasional	Brief-----	Dec-May	>6.0	---	---	>60	---	Low-----	Moderate.
LaB, LaC---------- Lakin	A	None------	---	---	>6.0	---	---	>60	---	Low-----	High.
Ld---------- Lindside	C	Occasional	Brief	Dec-Apr	1.5-3.0	Apparent	Dec-Apr	>60	---	Moderate	Low.
Ln---------- Lindside	C	Frequent--	Brief	Dec-May	1.5-3.0	Apparent	Dec-Apr	>60	---	Moderate	Low.
MaC3, MaD3-------- Markland	C	None------	---	---	3.0-6.0	Apparent	Dec-Apr	>60	---	High----	Moderate.
Mc---------- McGary	C	None------	---	---	1.0-3.0	Apparent	Jan-Apr	>60	---	High----	Low.
Me---------- Melvin	D	Occasional	Brief-----	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High----	Low.
Mf---------- Melvin	D	Frequent--	Brief to long.	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High----	Low.
Na---------- Newark	C	Occasional	Brief-----	Dec-Apr	0.5-1.5	Apparent	Dec-May	>60	---	High----	Low.
Ne---------- Newark	C	Frequent--	Brief to long.	Dec-May	0.5-1.5	Apparent	Dec-May	>60	---	High----	Low.
NhB2, NhC2, NkC4-- Nicholson	C	None------	---	---	1.5-2.5	Perched	Jan-Apr	>60	---	High----	Moderate.
No---------- Nolin	B	Occasional	Brief-----	Jan-Apr	3.0-6.0	Apparent	Feb-Mar	>60	---	Low-----	Moderate.
Nv---------- Nolin	B	Frequent--	Brief-----	Dec-May	3.0-6.0	Apparent	Jan-Mar	>60	---	Low-----	Moderate.
PeA, PeB---------- Pekin	C	None------	---	---	1.5-2.5	Perched	Dec-Apr	>60	---	Moderate	High.
Pt*. Pits, quarries											
RaC2---------- Riney	B	None------	---	---	>6.0	---	---	>60	---	Moderate	High.

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
ReD*, ReE*:											
Riney	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Lily	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High.
Rf	D	None	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High	High.
Robbs											
RkF*:											
Rock outcrop.											
Caneyville	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
RmD*:											
Rock outcrop.											
Corydon	D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low.
RnC2, RoC3	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Rosine											
RsD2*, RsD3*, RsE*:											
Rosine	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Gilpin	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
Lenberg	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
SaA, SaB2	C	None	---	---	1.5-2.0	Perched	Jan-Apr	>60	---	Moderate	High.
Sadler											
ScA, ScB	C	None	---	---	1.5-2.5	Perched	Dec-Apr	>60	---	Moderate	High.
Sciotoville											
Sf	C	Occasional	Brief	Dec-May	1.5-2.0	Apparent	Dec-Apr	>60	---	Moderate	High.
Steff											
St	C	Occasional	Brief	Dec-May	1.0-1.5	Apparent	Dec-May	>60	---	High	High.
Stendal											
VrF*:											
Varilla	B	None	---	---	>6.0	---	---	>60	---	Low	High.
Gilpin	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
Rock outcrop.											
W*											
Water											
We	C	None	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High	High.
Weinbach											
WtF*:											
Westmoreland	B	None	---	---	>6.0	---	---	40-60	Hard	Low	High.
Caneyville	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Rock outcrop.											

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
WxB, WxC2--------- Wheeling	B	None------	---	---	>6.0	---	---	>60	---	Low-----	Moderate.
Ya---------- Yeager	A	Occasional	Brief-----	Dec-May	4.0-6.0	Apparent	Dec-May	>60	---	Low-----	High.
ZaB2, ZaC2, ZnC3-- Zanesville	C	None------	---	---	2.0-3.0	Perched	Dec-Apr	40-60	Hard	Moderate	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Physical Analyses of Selected Soils

(A dash indicates the material was not detected. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see "Soil Series and Their Morphology." Soil samples were analyzed at the Kentucky Agricultural Experiment Station, Lexington, Kentucky)

Soil name, report number, horizon, and depth in inches	Total			Size class and particle diameter (mm)							Tex-tural class*	Coarse fragments		
				Sand						Very fine sand plus silt (0.1-0.002)		>2 mm	2-19 mm	19-76 mm
	Sand (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Sand coarser than very fine (2-0.1)					
	Pct <2mm											Pct	Pct	Pct
Baxter very gravelly silt loam: (87KY-163-3)														
Ap-----0 to 5	8.9	67.8	23.3	1.4	1.0	1.0	2.5	3.0	11.9	70.8	grvsil	43.8	19.4	24.4
Bt1----5 to 11	6.8	51.4	41.8	1.2	0.6	0.6	2.1	2.3	9.1	53.7	grsic	22.8	6.7	16.1
Bt2---11 to 20	5.9	37.8	56.3	0.5	0.5	0.6	2.1	2.2	8.1	40.0	grc	28.7	5.3	23.4
Bt3---20 to 37	6.5	27.6	65.9	0.5	0.5	0.5	2.3	2.7	9.2	30.3	grc	18.9	7.8	11.1
Bt4---37 to 55	8.6	24.0	67.4	0.6	0.8	0.8	3.1	3.3	11.9	27.3	grc	26.4	3.1	23.3
Bt5---55 to 71	3.9	24.5	71.6	0.4	0.3	0.3	1.3	1.6	5.5	26.1	grc	30.0	12.5	17.5
Bt6---71 to 97	4.4	31.2	64.4	1.0	0.4	0.3	1.2	1.5	5.9	32.7	grc	23.3	14.0	9.3
Crider silt loam: (88KY-027-6)														
Ap-----0 to 7	6.6	68.0	25.4	0.5	0.7	0.5	1.9	3.0	3.6	71.0	sil	---	---	---
Bt1----7 to 17	9.3	78.3	12.4	0.2	0.4	0.2	2.5	6.0	3.3	84.3	sil	---	---	---
Bt2---17 to 24	14.1	62.8	23.1	1.3	0.8	0.7	3.3	8.0	6.1	70.8	sil	---	---	---
Bt3---24 to 31	15.2	59.2	25.6	0.9	0.9	0.5	4.0	8.9	6.3	68.1	sil	---	---	---
2Bt4--31 to 38	15.4	51.3	33.3	0.3	0.5	0.4	3.6	10.6	4.8	61.9	sicl	---	---	---
2Bt5--38 to 56	18.6	25.8	55.6	2.9	0.2	0.2	3.2	12.1	6.5	37.9	c	5.0	5.0	---
2Bt6--56 to 80	31.7	17.5	50.8	0.1	0.1	0.1	1.5	29.9	1.8	47.4	c	---	---	---
Hammack silt loam: (87KY-163-4)														
Ap-----0 to 4	4.8	76.0	19.2	0.6	0.9	0.7	1.2	1.4	3.4	77.4	sil	3.7	3.7	---
AB-----4 to 9	3.4	72.2	24.2	0.3	0.6	0.4	0.9	1.2	2.2	73.4	sil	0.7	0.7	---
Bt1----9 to 17	3.1	68.5	28.4	0.1	0.5	0.2	0.8	1.5	1.6	70.0	sicl	4.0	4.0	---
B/E---17 to 27	7.6	69.1	23.3	1.2	1.1	0.5	1.6	3.2	4.4	72.3	sil	4.4	4.4	---
2Bt/E-27 to 40	10.4	57.0	32.6	2.9	1.4	0.7	2.2	3.2	7.2	60.2	grxsicl	71.8	5.8	66.0
2Bt2--40 to 53	1.8	19.0	71.3	0.2	0.2	0.1	0.5	0.8	1.0	19.8	c	9.9	2.4	7.5
2Bt3--53 to 73	1.7	16.3	73.8	---	0.1	0.1	0.5	1.0	0.7	17.3	c	1.6	1.6	---
2Bt4--73 to 86	1.3	11.4	79.6	---	---	---	0.5	0.8	0.5	12.2	c	2.1	2.1	---

See footnote at the end of the table.

Table 17.--Physical Analyses of Selected Soils--Continued

Soil name, report number, horizon, and depth in inches	Total			Size class and particle diameter (mm)							Coarse fragments		
				Sand						Very fine sand plus silt (0.1-0.002)				
	Sand (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Sand coarser than very fine (2-0.1)		Textural class*	>2 mm	2-19 mm	19-76 mm
	Pct <2mm											Pct	Pct	Pct
Rosine silt loam: (88KY-027-3)														
A------0 to 2	14.9	73.1	12.0	2.9	3.1	1.6	3.2	4.1	10.8	77.2	sil	---	---	---
E------2 to 7	12.5	71.9	15.6	0.5	0.5	0.5	4.0	7.0	5.5	78.9	sil	---	---	---
Bt1----7 to 21	6.9	66.3	26.8	0.5	0.5	0.4	1.4	6.5	2.8	72.8	sil	---	---	---
2Bt2--21 to 29	10.2	59.2	30.6	0.9	0.2	0.2	2.1	6.8	3.4	66.0	cnsicl	23.0	---	---
2Bt3--29 to 46	9.5	56.3	34.2	1.0	0.2	0.2	2.0	6.1	3.4	62.4	cnsicl	30.0	---	---
2BC---46 to 54	8.1	49.5	42.4	0.9	0.2	0.2	1.9	4.9	3.2	54.4	sic	6.0	---	---
2C----54 to 64	17.9	43.5	38.6	3.6	2.0	1.0	4.3	7.0	10.9	50.5	sicl	5.0	---	---
2Cr---64 to 78	4.5	45.1	50.4	0.2	0.5	0.5	1.8	1.5	3.0	46.6	sic	---	---	---
Sadler silt loam: (88KY-027-2)														
Ap1----0 to 2	15.8	69.4	14.8	1.0	1.6	1.0	5.0	7.2	8.6	76.6	sil	---	---	---
Ap2----2 to 8	18.0	73.6	8.4	3.0	3.2	1.3	4.3	6.2	11.8	79.8	sil	---	---	---
Bt1----8 to 14	9.7	77.4	12.9	1.5	1.2	0.9	2.2	3.9	5.8	81.3	sil	---	---	---
Bt2---14 to 21	9.6	71.7	18.7	2.0	1.2	0.6	2.0	3.8	5.8	75.5	sil	---	---	---
E/B---21 to 26	10.1	74.6	15.3	1.2	1.9	1.0	2.0	4.0	6.1	78.6	sil	---	---	---
Btx1--26 to 38	8.9	68.6	22.5	1.0	1.0	0.9	2.0	4.0	4.9	72.6	sil	1.0	1.0	---
2Btx2-38 to 59	18.6	64.2	17.2	2.0	1.0	0.7	5.4	9.5	9.1	73.7	sil	5.0	5.0	---
2C----59 to 76	56.9	23.4	19.7	6.2	4.0	4.2	2.0	40.5	16.4	63.9	grvfsl	60.0	---	---

* Under "Textural class," the abbreviation grvsl means very gravelly sandy loam; sil, silt loam; grsil, gravelly silt loam; grvsil, very gravelly silt loam; sicl, silty clay loam; cnsicl, channery silty clay loam; grxsicl, extremely gravelly silty clay loam; sic, silty clay; grsic, gravelly silty clay; c, clay; and grc, gravelly clay.

Table 18.—Chemical Analyses of Selected Soils

[$CaCl_2$ (1:2), KCl (1:1), and hydrogen plus aluminum were not detected. Dashes indicate the element was not detected. Tr means trace. The pedons are typical of the soil series in the survey area. For the location of the pedons, see the section "Soil Series and Their Morphology." Soil samples were analyzed at the Kentucky Agricultural Experiment Station, Lexington, Kentucky]

Soil name, report number, horizon, and depth in inches	pH	Extractable cations					Cation-exchange capacity		Extractable acidity	Base saturation		Organic matter	Calcium carbonate equivalent	Phosphorus	Potassium
	H_2O 1:1	Ca	Mg	K	Na	Total (TEC)	Ammonium acetate	Sum of cations		Ammonium acetate	Sum of cations				
		Milliequivalents per 100 grams of soil								Pct	Pct	Pct	Pct	p/m	p/m
Baxter very gravelly silt loam: (87KY-163-3)															
Ap----- 0 to 5	5.6	7.0	1.0	0.3	Tr	8.3	12.6	15.7	7.4	65.9	52.9	1.6	0.4	64	361
Bt1---- 5 to 11	5.2	3.4	1.8	0.1	0.1	5.4	13.8	15.5	10.1	39.1	34.8	0.2	Tr	2	188
Bt2---- 11 to 20	5.2	4.8	3.6	0.2	0.1	8.7	19.3	20.2	11.5	45.0	43.0	0.2	0.1	1	234
Bt3---- 20 to 37	5.3	5.3	4.4	0.3	0.1	10.1	20.6	22.8	12.7	49.0	44.3	0.3	0.1	1	364
Bt4---- 37 to 55	5.1	5.4	4.4	0.3	0.1	10.2	20.7	22.0	11.8	49.3	46.4	0.2	Tr	4	406
Bt5---- 55 to 71	5.1	6.3	4.6	0.3	0.1	11.3	21.9	23.7	12.4	51.6	47.7	0.2	Tr	2	328
Bt6---- 71 to 97	5.3	5.0	4.2	0.2	0.3	9.7	20.1	21.7	12.0	48.3	44.7	0.1	0.1	2	302
Crider silt loam: (88KY-027-6)															
Ap----- 0 to 7	6.3	5.7	1.2	0.2	0.1	7.2	11.1	17.5	10.3	64.9	41.1	2.4	0.2	16	167
Bt1---- 7 to 17	6.3	3.0	1.1	0.1	0.1	4.3	8.5	7.5	3.2	50.6	57.3	0.9	1.0	2	159
Bt2---- 17 to 24	5.9	5.1	1.4	0.2	Tr	6.7	9.3	13.9	7.2	72.0	48.2	0.2	0.2	5	140
Bt3---- 24 to 31	5.6	4.4	1.7	0.1	0.1	6.3	9.0	13.6	7.3	70.0	46.3	0.3	1.0	3	143
2Bt4--- 31 to 38	5.4	4.8	2.2	0.2	Tr	7.2	10.8	16.3	9.1	66.6	44.2	0.2	0.1	4	178
2Bt5--- 38 to 56	5.2	6.7	1.3	0.3	0.1	8.4	15.8	20.3	11.9	53.2	41.4	0.5	0.1	2	277
2Bt6--- 56 to 80	5.0	6.8	2.2	0.3	0.1	9.4	16.4	20.3	10.8	57.9	46.8	0.3	0.1	2	290
Hammack silt loam: (87KY-163-4)															
Ap----- 0 to 4	6.1	3.9	0.5	0.9	Tr	5.3	11.0	12.2	6.9	48.2	43.4	2.6	0.1	32	600
AB----- 4 to 9	5.9	4.2	1.0	0.3	0.1	5.6	12.3	15.0	9.4	45.5	37.3	1.6	0.1	8	455
Bt1---- 9 to 17	5.6	4.0	1.4	0.2	0.1	5.7	12.6	12.7	7.0	45.2	44.9	0.4	0.1	2	278
B/E---- 17 to 27	5.0	3.1	0.8	0.3	0.1	4.3	11.9	13.8	9.5	36.1	31.2	0.1	0.2	2	286
2Bt/E-- 27 to 40	4.9	2.0	1.2	0.4	0.2	3.8	11.7	14.0	10.2	32.5	27.1	0.2	0.2	2	466
2Bt2--- 40 to 53	5.0	5.0	3.0	0.7	0.3	9.0	23.2	26.4	17.4	38.8	34.1	0.4	0.1	2	600
2Bt3--- 53 to 73	5.1	6.3	2.3	0.4	0.1	9.1	24.6	25.8	16.7	37.0	35.3	0.4	0.1	2	368
2Bt4--- 73 to 86	5.2	10.1	2.2	0.3	0.1	12.7	27.2	28.2	15.5	46.7	45.0	0.3	Tr	2	302

Table 18.--Chemical Analyses of Selected Soils--Continued

Soil name, report number, horizon, and depth in inches	pH	Extractable cations					Cation-exchange capacity		Extractable acidity	Base saturation		Organic matter	Calcium carbonate equivalent	Phosphorus	Potassium
	H_2O 1:1	Ca	Mg	K	Na	Total (TEC)	Ammonium acetate	Sum of cations		Ammonium acetate	Sum of cations				
		-----Milliequivalents per 100 grams of soil------								Pct	Pct	Pct	Pct	p/m	p/m
Rosine silt loam: (88KY-027-3)															
A------ 0 to 2	4.7	1.6	0.6	0.3	2.8	5.3	14.8	19.4	14.1	35.8	19.4	8.5	Tr	30	183
E------ 2 to 7	4.8	1.0	0.7	0.6	1.6	3.9	8.0	11.6	7.7	48.8	33.6	2.8	0.2	14	222
Bt1---- 7 to 21	4.7	0.8	1.5	0.2	0.1	2.6	13.1	14.2	11.6	19.8	18.3	0.6	Tr	6	187
2Bt2--- 21 to 29	4.7	2.3	2.8	0.3	0.1	5.5	16.5	19.6	14.1	33.3	28.1	0.2	Tr	12	254
2Bt3--- 29 to 46	4.8	4.7	4.7	0.7	0.1	10.2	18.2	28.1	17.9	56.0	36.3	0.2	Tr	5	243
2BC---- 46 to 54	4.7	10.2	9.7	0.9	0.5	21.3	30.3	50.7	29.4	70.3	42.0	0.4	0.4	8	368
2C----- 54 to 64	4.9	17.9	14.8	0.9	1.1	34.7	38.3	45.4	10.7	90.6	76.4	3.3	0.3	17	375
2Cr---- 64 to 78	5.3	12.8	11.5	0.9	0.6	25.8	30.3	29.9	4.1	85.1	86.3	0.2	Tr	76	390
Sadler silt loam: (88KY-027-2)															
Ap1---- 0 to 2	6.1	15.4	1.4	0.5	0.1	17.4	12.3	23.7	6.3	141.5	73.4	6.2	0.3	125	366
Ap2---- 2 to 8	6.6	9.5	0.4	0.2	Tr	10.1	7.4	14.1	4.3	136.5	70.1	2.8	0.1	26	198
Bt1---- 8 to 14	5.6	8.3	0.7	0.2	Tr	9.2	7.7	12.6	3.4	119.5	73.0	1.0	0.1	7	116
Bt2---- 14 to 21	4.9	3.9	0.9	0.2	0.1	5.1	8.8	13.8	8.7	58.0	37.0	0.7	0.4	6	118
E/B---- 21 to 26	4.9	2.4	1.5	0.1	0.1	4.1	8.5	13.5	9.4	48.2	30.4	0.4	0.1	5	110
Btx1--- 26 to 38	4.9	2.1	1.3	0.2	0.2	3.8	12.4	11.3	7.5	30.6	33.6	0.2	0.1	4	173
2Btx2-- 38 to 59	5.1	2.7	1.3	0.1	0.2	4.3	9.4	10.4	6.1	45.7	41.3	0.4	0.4	10	117
2C----- 59 to 76	5.2	4.8	2.0	0.1	0.3	7.2	10.8	10.7	3.5	66.6	67.3	---	0.1	5	104

Table 19.--Sand Mineralogy of Selected Soils

(Dashes indicate the mineral was not detected. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see the section "Soil Series and Their Morphology." Soil samples were analyzed at the Kentucky Agricultural Experiment Station, Lexington, Kentucky)

Soil name, report number, horizon, and depth in inches	Percent resistant minerals				Percent weatherable minerals								
	Quartz	Opaques	Resistant aggregates	Total resistant minerals	Mica	Kaolinite	Chlorite	Pyroxenes	Feldspars	Interstratified	Sericite	Total weatherable aggregates	Fraction analyzed
	Pct			Pct	Pct	Pct		Pct	Pct	Pct		Pct	mm
Crider silt loam:													
(88KY-027-6)													
Bt1------ 7 to 17	11	---	---	11	7	5	---	70	---	7	---	89	0.25-0.02
Bt2------17 to 24	8	---	---	8	5	3	---	80	---	4	---	92	0.25-0.02
Bt3------24 to 31	9	---	---	9	3	3	---	82	---	3	---	91	0.25-0.02
Rosine silt loam:													
(88KY-027-3)													
Bt1------ 7 to 21	78	---	---	78	5	6	---	---	7	4	---	22	0.25-0.02
2Bt2-----21 to 29	76	---	---	76	7	4	---	---	6	7	---	24	0.25-0.02
2Bt3-----29 to 46	80	---	---	80	5	5	---	---	5	5	---	20	0.25-0.02
Sadler silt loam:													
(88KY-027-2)													
Bt1------ 8 to 14	86	---	---	86	5	4	---	---	5	---	---	14	0.25-0.02
Bt2------14 to 21	89	---	---	89	4	---	---	---	7	---	---	11	0.25-0.02
E/B------21 to 26	83	---	---	83	5	3	---	---	9	---	---	17	0.25-0.02
Btx1-----26 to 38	74	---	---	74	8	6	---	---	12	---	---	26	0.25-0.02

Table 20.--Clay Mineralogy of Selected Soils

(A dash indicates the mineral was not detected. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see the section "Soil Series and Their Morphology." Soil samples were analyzed at the Kentucky Agricultural Experiment Station, Lexington, Kentucky)

Soil name, report number, horizon, and depth in inches	Quantitative estimates of clay minerals										
	Quartz	Smectite	Vermic-ulite	Hydroxy-interlayered vermiculite	Chlorite	Inter-strati-fied	Kaolinite	Mica	Gibbsite	Goethite feldspar	Feldspars
	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct
Baxter very gravelly silt loam:											
(87KY-163-3)											
Bt1------ 5 to 11	5	---	---	37	---	12	32	8	---	6	---
Bt2------11 to 20	4	---	---	35	---	11	35	8	---	7	---
Bt3------20 to 37	4	---	---	29	---	9	42	8	---	8	---
Crider silt loam:											
(88KY-027-6)											
Bt1------ 7 to 17	5	9	---	35	---	5	25	15	---	3	3
Bt2------17 to 24	6	16	---	30	---	5	22	15	---	4	2
Bt3------24 to 31	5	17	---	33	---	---	27	14	---	3	1
Hammack silt loam:											
(87KY-163-4)											
Bt1------ 9 to 17	5	---	---	32	---	9	29	13	---	12	---
B/E------17 to 27	8	---	---	31	---	15	29	10	---	7	---
2Bt/E----27 to 40	10	---	---	30	---	13	38	6	---	3	---
Rosine silt loam:											
(88KY-027-3)											
Bt1------ 7 to 21	9	15	10	20	---	5	20	15	---	2	4
2Bt2-----21 to 29	6	30	16	10	---	3	16	15	---	2	2
2Bt3-----29 to 46	---	---	---	---	---	---	---	19	---	---	---
Sadler silt loam:											
(88KY-027-2)											
Bt1------ 8 to 14	5	---	---	32	---	4	36	17	---	3	3
Bt2------14 to 21	6	---	---	36	---	5	32	15	---	3	3
E/B------21 to 26	7	---	---	31	---	4	33	18	---	3	4
Btx1-----26 to 38	3	---	---	38	---	3	35	17	---	2	2

Table 21.--Engineering Index Test Data

(LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; and SG, specific gravity. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see the section "Soil Series and Their Morphology." Soil samples were analyzed by the Natural Resources Conservation Service, Soil Mechanics Laboratory, Fort Worth, Texas)

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											LL	PI	Moisture density		SG
			Percentage passing sieve--								Percentage smaller than--							
	AASHTO	Unified	>3 inch	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM	
			Pct											Pct		Lb/ cu ft	Pct	
Crider silt loam:																		
(88KY-027-6)																		
Bt1------7 to 17	A-6 (16)	CL	100	100	100	100	100	100	100	100	65	30	21	36	15	109.0	16.0	2.75
Bt3-----24 to 31	A-6 (16)	CL	100	100	100	100	100	100	100	92	63	36	26	36	18	112.0	15.0	2.73
2Bt5----38 to 56	A-7-6 (40)	CH	100	100	100	100	100	100	100	88	70	56	51	65	41	98.5	23.5	2.72
Rosine silt loam:																		
(88KY-027-3)																		
Bt1-------7 to 21	A-6 (20)	CL	100	100	100	100	100	100	100	99	68	42	34	40	18	108.0	17.5	2.71
2Bt3-----29 to 46	A-7-6 (14)	CH	100	100	89	76	69	58	56	54	40	23	18	54	33	103.5	19.5	2.72

Table 22.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alford	Fine-silty, mixed, mesic Typic Hapludalfs
Baxter	Fine, mixed, mesic Typic Paleudalfs
Caneyville	Fine, mixed, mesic Typic Hapludalfs
Chagrin	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Clifty	Fine-loamy, mixed, mesic Fluventic Dystrochrepts
Corydon	Clayey, mixed, mesic Lithic Argiudolls
Crider	Fine-silty, mixed, mesic Typic Paleudalfs
Cuba	Fine-silty, mixed, mesic Fluventic Dystrochrepts
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Fredonia	Fine, mixed, mesic Typic Hapludalfs
Gatton	Fine-loamy, mixed, mesic Typic Fragiudalfs
Gilpin	Fine-loamy, mixed, mesic Typic Hapludults
Hammack	Fine-silty, mixed, mesic Glossic Paleudalfs
Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs
Huntington	Fine-silty, mixed, mesic Fluventic Hapludolls
Lakin	Mixed, mesic Argic Udipsamments
Lenberg	Fine, mixed, mesic Ultic Hapludalfs
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Markland	Fine, mixed, mesic Typic Hapludalfs
McGary	Fine, mixed, mesic Aeric Ochraqualfs
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Newark	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents
Nicholson	Fine-silty, mixed, mesic Typic Fragiudalfs
Nolin	Fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Pekin	Fine-silty, mixed, mesic Aquic Fragiudalfs
Riney	Fine-loamy, siliceous, mesic Typic Hapludults
Robbs	Fine-silty, mixed, mesic Aquic Fragiudalfs
Rosine	Fine-silty, mixed, mesic Ultic Hapludalfs
Sadler	Fine-silty, mixed, mesic Glossic Fragiudalfs
*Sciotoville	Fine-silty, mixed, mesic Aquic Fragiudalfs
Steff	Fine-silty, mixed, mesic Fluvaquentic Dystrochrepts
Stendal	Fine-silty, mixed, acid, mesic Aeric Fluvaquents
Varilla	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
Weinbach	Fine-silty, mixed, mesic Aeric Fragiaqualfs
Westmoreland	Fine-loamy, mixed, mesic Ultic Hapludalfs
Wheeling	Fine-loamy, mixed, mesic Ultic Hapludalfs
Yeager	Sandy, mixed, mesic Typic Udifluvents
Zanesville	Fine-silty, mixed, mesic Typic Fragiudalfs

Table 23.--Geologic Systems, Series, Formations, and Members

System	Series	Formation	Member	Dominant soils
Quaternary-------	---	---	---	Huntington, Nolin, Newark, Chagrin, Cuba, Stendal
Tertiary and Quarternary-----	Pliocene and Pleistocene	---	---	Elk, Sciotoville, Markland, Weinbach, Wheeling
Pennsylvanian----	Lower and Middle	Tradewater and Caseyville Sandstones and Shales	---	Rosine, Gilpin, Lenberg
Mississippian----	Chester	Buffalo Wallow	Kinkaid Limestone, Sandstone, and Shale; Menard Limestone; Vienna Limestone	Caneyville, Rosine, Lenberg
		Tar Springs Sandstone and Shale	---	Varilla, Gilpin, Dekalb, Lenberg, Rosine
		Glen Dean Limestone, Sandstone, and Shale	---	Caneyville, Gilpin, Rosine, Lenberg
		Hardinburg Sandstone and Shale	---	Sadler, Zanesville, Robbs, Gilpin
		Golconda	Haney Limestone, Big Clifty Sandstone, Beech Creek Limestone	Caneyville, Sadler, Zanesville, Robbs
		Elwren Sandstone	---	Rosine, Gilpin, Zanesville
		Reelsville Limestone	---	Caneyville
		Sample Sandstone and Shale	---	Sadler, Zanesville, Robbs, Gilpin, Rosine, Lenberg
		Beaver Bend Limestone	---	Caneyville

Table 23.--Geologic Systems, Series, Formations, and Members--Continued

System	Series	Formation	Member	Dominant soils
Mississippian (continued)	Chester (continued)	Mooretown	Sandstone	Riney, Lily, Gatton
		Paoli Limestone	---	Caneyville, Fredonia, Crider
	Meramec	St. Louis and Ste. Genevieve Limestones	---	Crider, Hammack, Baxter, Fredonia, Caneyville, Corydon
		Salem and Harrodsburg Limestones	---	Caneyville, Crider
	Osage	Borden	Muldraugh Siltstone	Westmoreland

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Nondiscrimination Statement

Nondiscrimination Policy

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

To File an Employment Complaint

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

To File a Program Complaint

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

Persons with Disabilities

If you are deaf, are hard of hearing, or have speech disabilities and you wish to file either an EEO or program complaint, please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

If you have other disabilities and wish to file a program complaint, please see the contact information above. If you require alternative means of communication for

program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Supplemental Nutrition Assistance Program

For additional information dealing with Supplemental Nutrition Assistance Program (SNAP) issues, call either the USDA SNAP Hotline Number at (800) 221-5689, which is also in Spanish, or the State Information/Hotline Numbers (http://directives.sc.egov.usda.gov/33085.wba).

All Other Inquiries

For information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices (http://directives.sc.egov.usda.gov/33086.wba).