Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

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

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

About 30 percent of the county is used for cultivated crops. About 500,000 acres is in nonirrigated crops and about 12,250 acres, mainly along the Missouri and Redwater Rivers and Prairie Elk Creek, is in irrigated crops. Spring wheat and winter wheat are the principal nonirrigated crops, but barley, safflower, oats, alfalfa hay, grass-legume hay, and grass hay are also grown.

Alfalfa hay is the principal irrigated crop. Grass-legume hay, spring wheat, and corn for silage are other important irrigated crops grown.

The main concerns in managing nonirrigated cropland in this county are conserving moisture, controlling soil blowing and water erosion, and maintaining soil fertility. In the northeastern part of the county saline seeps are a serious problem, contaminating about 1,000 acres.

Conserving moisture generally entails reducing evaporation, limiting runoff, increasing infiltration, and controlling weeds. Among the effective means of conserving moisture are stubble mulching, contour farming, stripcropping, using field windbreaks, timely tillage, minimum tillage, and using crop residue. Fallow helps to conserve moisture as well as to control weeds and to release nitrogen from the organic matter by bacterial action.

Among the measures that help to control soil blowing and water erosion are stubble mulch tillage, stripcropping, using field windbreaks and tall grass barriers, contour cultivating, minimum tillage, returning crop residue to the soil, and using diversions and grassed waterways. Generally, a combination of several of these measures is used.

Among the measures that help to maintain fertility are applying chemical fertilizer and barnyard manure and using green manure crops. Controlling erosion also helps to maintain fertility. All of the soils in the county used for nonirrigated crops respond to fertilizer.

Suitable practices for reducing the development of saline seeps are using flexible cropping systems, seeding legumes in recharge areas, and providing surface and subsurface drainage where needed. Weed control, fertilization, stubble management, use of wind

barriers and shelterbelts, proper tillage, and erosion control also need to be considered.

The main concerns in managing irrigated cropland in this county are land leveling, ditch lining, erosion control structures, irrigation water quality, and the timely application of the proper amounts of water.

In recent years there has been interest in growing safflower and millet in the county; however, a limited amount of acreage is planted to these crops. In 1980, 527 acres of millet was grown and 5,000 acres of safflower was grown.

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

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

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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 Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

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 grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

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

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

Class I soils have slight 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 limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, 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 capability classification of each map unit is given in the section "Detailed Soil Map Units."

Rangeland

by Robert Lineard, range conservationist, Soil Conservation Service.

Rangeland produces a native plant community of mainly grasses, forbs, and shrubs. The primary use of rangeland is grazing domestic livestock. However, it has other uses such as for wildlife, recreation, watershed, and natural beauty.

In this county about 63 percent of the land, or slightly more than 1 million acres, is managed as rangeland. It is the largest single resource in the county, providing forage for nearly 50,000 head of cattle and nearly 15,000 head of sheep in 1977. The sale of livestock and livestock products accounts for about one-half of the farm and ranch income. Cow-calf operations are dominant. Some operators hold calves for sale as yearlings.

There are many different soils in this county. For this reason, there are several different kinds of rangeland called range sites. Over the centuries, nature has developed a combination of plants that are best adapted to particular soils and climate. If not abnormally disturbed, this combination of plants is the potential or climax plant community for the site. Climax plant communities are not static and will vary slightly from year to year and place to place. Each range site will differ from other range sites in the kind, amount, and proportion of native plants that it supports.

Range conservationists and soil scientists group the soils into appropriate range sites. Thus, range sites generally can be determined from the soil map.

Soil properties that affect moisture supply and plant nutrients have the most influence on range production. Soil reaction, salt content, and a seasonal high water table are also important in determining the kinds of plants that grow in a particular location.

Abnormal disturbance, such as repeated overuse by livestock or excessive burning, erosion, or plowing, will change the climax plant community. If the disturbance is severe enough, the climax community can be completely destroyed and less desirable plants such as annuals and weedlike plants may invade.

Four range condition classes are used to show the extent of deterioration. Rangeland is in excellent condition if more than 75 percent, by weight, of the present plant community is the same as the climax plant community. It is in good condition if the percentage is 51 to 75; fair if the percentage is 26 to 50; and poor if the percentage is less then 25.

Knowledge of the range site and condition is necessary as a basis for planning and applying needed management to improve or maintain the desired plant community for selected uses. Such information is needed for choosing management objectives, planning grazing systems and stocking rates, determining wildlife management, determining recreation potential, and rating watershed conditions.

Rangeland management needs to provide for a plant cover that will adequately protect or improve the soil and water resources and that will meet the needs of the operator. This generally involves restoring the plant community to near climax condition. Sometimes, however, a plant cover somewhat below potential will better fit specific grazing or wildlife habitat needs while still protecting the resource.

Grazing management is the most important part of any rangeland management program. Proper grazing, deferred grazing, and planned rotation grazing systems are key practices. Rancher experience and research have shown that if about one-half of the current year's growth of range plants is grazed, a plant community in good or excellent condition can be maintained and one in fair condition can be improved. The remaining one-half enables the plant to make food for regrowth, root development, and storage for future growth. This makes the desirable plants healthier and helps keep them from being replaced by less desirable plants and weeds. It also protects the soil from erosion by wind or water and acts as a mulch that improves soil tilth and water infiltration and reduces runoff.

Certain practices are often needed to obtain uniform grazing use. These include development of water for livestock, fencing, proper location of salt and mineral supplements, constructing stock trails in rougher areas, and riding or herding. These practices generally are essential for good rangeland management.

Special improvement practices are needed in places where management practices do not achieve the desired results or where recovery is too slow by forage management alone. These include range seeding, brush control, waterspreading, prescribed burning, and mechanical treatment.

Where feasible, mechanical renovation practices such as shallow chiseling and scalping can help to speed recovery. These practices open up the soil surface to allow more moisture to be absorbed, which encourages production of the more desirable plants. Use of these practices and brush control must be followed by resting or deferred grazing for at least two growing seasons to allow better recovery of the desired plants.

Seeding may be needed in areas dominated by less desirable plants. A clean, firm seedbed should be prepared, seeded to adapted native species, and then rested two growing seasons to allow the new plants to become established.

Good rangeland management results in rangeland that can adequately support the livestock and wildlife in the county. It also adds to the natural beauty of the area.

Woodland Management and Productivity

About 4,500 acres of the county is forested, of which 3,600 acres is productive enough to be considered commercial. The commercial forests mostly grow on

alluvial soils along the Missouri River. Small areas of noncommercial forests of ponderosa pine and Rocky Mountain juniper are near Fort Peck Reservoir, mostly on shallow soils derived from shale. The most common tree species growing in the commercial forests along the Missouri River is plains cottonwood. Box elder, green ash, and Russian-olive commonly grow in the understory of cottonwood stands.

Stands of cottonwood commonly grow on the Glendive, Hoffmanville, Hanly, Harlem, Havre, Havrelon, Lohler, and Trembles soils. Some of the forest land on these soils has been converted to cropland and pastureland.

All of the forest land within the county is grazed. In winter, forests along the Missouri River provide protection for livestock and ranchers use the forested areas for feeding areas.

A small number of the cottonwood trees are harvested for firewood. Little additional use is made of the wood, although it does have value as chips for paper, decking, crating, and framing for stuffed furniture.

Reestablishment of cottonwood from seed is most successful in seedbeds of moist mineral soils, commonly in areas subject to flooding. Cottonwood can also regenerate by root or stump sprouts; however, the ability of the trees to sprout decreases as they get older. With the construction of Fort Peck Dam, flooding has been reduced; consequently, areas suitable for the regeneration of cottonwood from seed have been reduced. The control of the water level in the Missouri River below Fort Peck Reservoir may also have reduced the productivity of the stands of cottonwood. Rate of diameter growth has been reduced since the construction of the reservoir. In future years, the planting of cottonwood seedlings may become necessary to maintain cottonwood stands. Green ash regenerates successfully from seed in areas where water temporarily ponds. Russian-olive can be established from seed under stands of cottonwood. Cottonwood is the most desirable of these trees for commercial wood production.

To aid those who manage forest land in this county, soil interpretations relating to forest use and management have been developed. Factors considered for interpretation are timber productivity, erosion hazard, equipment limitations, plant competition, seedling mortality, windthrow hazard, applicable silvicultural systems, and kinds of understory plants.

Woodland management information for each forested soil is given in the map unit descriptions in the section "Detailed Soil Map Units." If a particular management limitation is not discussed in the map unit, the limitation is not significant to use and management of the unit for timber production. The map units that include forest land are listed below.

75 Glendive loam, protected.
77 Glendive silty clay loam, protected.
78 Glendive-Hanly complex, protected.
79 Hanly loamy fine sand.
81 Harlem silty clay, protected.
84 Havre silty clay loam.
85 Havre silty clay loam, protected.
86 Havrelon loam.
87 Havrelon loam, protected.
89 Havrelon silty clay loam.
90 Havrelon silty clay loam, protected.
96 Hoffmanville silty clay, protected.
102 Lohler silty clay loam, protected.
104 Lohler silty clay, protected.
139 Trembles fine sandy loam.
140 Trembles fine sandy loam, protected.

In the following paragraphs definitions and explanations of the terms used in the discussion of woodland management in the map units are given.

Potential soil productivity is the estimated yield of each forest species that a given soil can produce under a given level of management. It is expressed as a site index. This index is the average height, in feet, that the dominant and codominant trees of a given species attain in a specified number of years. For cottonwood the specified number is 30 years. Site index values can be related to yield tables to determine the potential yield of wood products per acre in board feet or cubic feet. The species for which yield and site index calculations were made in each map unit generally are the most common ones on the unit and the most desirable to manage for timber production.

The site index values for plains cottonwood were determined by adjusting site index curves for eastern cottonwood (*3*). Gross board foot volumes per acre were determined by measurements taken during the soil survey. Eight-foot logs down to an 8-inch diameter at the top were measured in determining board foot volumes. Cubic volume per acre was determined by applying a conversion factor of 5.2 board feet per cubic foot. Cubic volume includes the entire tree, excluding the bark and twigs.

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

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

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

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

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

Species suitability refers to tree species that are adapted to the soil being rated and are desirable to plant or manage for timber production.

Silvicultural system refers to methods of harvesting trees that provide for the regeneration of desirable tree species, develop a desirable stand structure, and aid in insect and disease control. The application of a particular silvicultural system is determined by the kinds of trees a given soil supports, management objectives, and the condition of the stand.

The selection silvicultural system involves the removal of mature and immature trees either singly or in groups at specific intervals (*8*). Regeneration is established almost continuously, and an uneven-aged stand is maintained. This system favors the regeneration of the more tolerant of associated trees.

The shelterwood silvicultural system involves removing the stand in a series of cuts. Regeneration occurs under a partial forest canopy. After regeneration is established, a final cut removes the shelterwood and permits the stand to develop in the open as an even-aged stand. This system is well adapted to sites where shelter is needed for new reproduction, and it favors regeneration of the less tolerant species in a forest stand.

Culmination of mean annual increment (CMAI) is the point in time at which average annual yield reaches the maximum.

Windbreaks

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Windbreaks are discussed in the map unit descriptions in the section "Detailed Soil Map Units." Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or of the Cooperative Extension Service or from a nursery.

Recreation

The potential for recreational development in this county is greatest in the vicinity of Vida and Circle and along the shores of Fort Peck Lake. Along Fort Peck Lake the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service have developed camping, picnicking, and boat launching facilities. Use of the facilities is increasing yearly.

The soils of the survey area are rated in table 6 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 6, 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 by a combination of these measures.

The information in table 6 can be supplemented by other information in this survey, for example,

interpretations for septic tank absorption fields in table 8 and interpretations for dwellings without basements and for local roads and streets in table 7.

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, horseback riding, and bicycling 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.

Wildlife Habitat

By Ronald F. Batchelor, biologist, Soil Conservation Service.

The abundance of wildlife is directly related to the extent and diversity of its habitat. Productive, well managed soils generally support or have potential to support vigorous wildlife populations, while infertile, poorly managed soils generally support sparse populations. The suitability of a given habitat for a wildlife species depends greatly on the nature of the plant community, and the quantity, quality, and distribution of a particular habitat is determined by prevailing land use practices and management. These factors are governed to some extent by the soils in the areas. Climate, present use of the soils, juxtaposition of habitat types or elements, and present distribution of wildlife species also affect wildlife habitat. For these reasons, the selection and suitability of an area for wildlife habitat requires onsite evaluation.

Grassland, nonirrigated and irrigated cropland, riparian woodland, streams and rivers, ponds, marshes, and reservoirs provide a variety of habitat for wildlife in this county.

Irrigated and nonirrigated farming made possible the successful introduction of the ring-necked pheasant and the gray partridge, particularly on the bottom lands of the Missouri River and its tributaries. Small grain, irrigated crops, annual weeds, and brushy cover are all available. Pheasant populations in the county are limited by the very farming practices that fostered them. In recent years, more intensive farming and the loss of brushy fence rows, densely vegetated ditchbanks, and idle areas have coincided with a decline in the numbers of pheasants. There has also been increased grazing of the flood plains adjacent to and within areas used as winter cover for pheasants.

Land management practices beneficial to pheasants include proper grazing, maintaining woody cover, and retaining stubble and waste grain on the soil during winter by avoiding fall tillage, growing shelterbelts and hedgerows of woody plantings, and growing crops for control of erosion. These practices are also beneficial to a variety of nongame birds. The irrigated and nonirrigated cropland, brushy ditchbanks, and fence rows on general map unit 2 provide habitat for ring-necked pheasant.

The grain fields, shelterbelts, and brushy drainageways on units 4, 13, and 15 provide good upland habitat. Units 13, 14, and 16 support vegetation suitable as habitat for sharp-tailed grouse and gray partridge. The vegetation includes grain, brush in draws, trees, fruit-bearing shrubs, such as chokecherry, plum, rose, snowberry, and buffaloberry, and grasses. Land management practices beneficial to sharp-tailed grouse and gray partridge include proper grazing to maintain sufficient vegetation for nesting, roosting, and rearing of young and protection of woody vegetation in draws and along fence rows. Sage grouse use the brush in the drainageways and the sagebrush rangeland on units 7 and 10. Optimum vegetation for sage grouse habitat consists of big sagebrush, silver sagebrush, forbs, and grasses.

White-tailed deer and mule deer are throughout the county. White-tailed deer generally are along the flood plain of the Missouri River and its tributaries, mainly in units 1 and 2. Mule deer are mainly in the western part of the county, on the uplands, brushy bottoms, and broken rangelands of units 19, 20, and 21. Pronghorn antelope occupy the prairies of the county along with domestic livestock. Units 13, 16, and 20 provide most of the habitat for pronghorn antelope. Proper management of rangeland is important for maintaining adequate habitat for pronghorn antelope.

The Missouri River and marshes, ponds, and reservoirs throughout the county provide habitat for an abundance of waterfowl during spring and fall migrations. Migatory birds use riverine habitat for nesting, feeding, and resting. Substantial populations of Canada geese use the river throughout the year. Geese nest on the

larger islands and use sparsely vegetated sandbars as resting and feeding areas. Croplands adjacent to the river are important feeding areas for migratory waterfowl.

Beaver, mink, muskrat, and raccoon are throughout the principal watercourses. Cottontail rabbit, badgers, ground squirrels, coyotes, and a variety of small mammals can be found throughout the county.

Engineering

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

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

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) 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 7 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, slippage, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented

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

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

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

Sanitary Facilities

Table 8 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 8 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 8 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

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

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

and covered daily with a thin layer of soil from a source away from the site.

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

The ratings in table 8 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, slippage, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

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

Construction Materials

Table 9 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 9, 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 10 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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

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

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

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

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

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

Water Management

Table 10 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

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

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

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a

cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

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

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

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

Engineering Index Properties

Table 11 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

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

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

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

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

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

The estimates of grain-size distribution, liquid limit, and plasticity index are 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 12 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

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

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

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

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

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

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 12, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased 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 13 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 13 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a

saturated zone, namely grayish colors or mottles in the soil. Indicated in table 13 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 13.

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. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft 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.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

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

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

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

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*9*). 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. In table 14, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

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

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 Ochrept (*Ochr*, meaning pale, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Ustochrepts (*Ust*, meaning ustic moisture regime, plus *ochrept*, the suborder of the Inceptisols.

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

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

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

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. 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* (*7*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*9*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

Absher Series

The Absher series consists of deep, well drained, very slowly permeable, salt- and sodium-affected soils that formed in alluvium or glacial till. These soils are in small depressional areas on fans, foot slopes, and hillsides of uplands. Slope is 0 to 15 percent.

These soils are fine, montmorillonitic Borollic Natrargids.

Typical pedon of an Absher clay loam in an area of Gerdrum-Absher clay loams, 0 to 8 percent slopes, in rangeland, about 450 feet north and 1,970 feet east of the southwest corner of sec. 21, T. 21 N., R. 44 E.

A2—0 to 1 inch; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many fine vesicular pores; mildly alkaline; abrupt smooth boundary.

B21t—1 inch to 5 inches; grayish brown (2.5Y 5/2) heavy clay loam, dark grayish brown (2.5Y 4/2) moist; strong fine and medium prismatic structure parting to strong fine and medium subangular blocky; hard, firm, sticky and plastic; few fine roots; common fine tubular pores; common thin clay films on horizontal and vertical faces of peds; moderately alkaline; clear wavy boundary.

B22t—5 to 11 inches; grayish brown (2.5Y 5/2) heavy clay loam, dark grayish brown (2.5Y 4/2) moist; strong fine and medium prismatic structure parting to strong fine and medium subangular blocky; hard, firm, sticky and plastic; few fine roots; common fine tubular pores; common thin clay films on horizontal and vertical faces of peds; slightly effervescent; strongly alkaline; clear wavy boundary.

B31ca—11 to 16 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; strong medium and coarse prismatic structure; hard, firm, sticky and plastic; few fine roots; common fine tubular pores; common threadlike masses of lime; strongly effervescent; strongly alkaline; clear wavy boundary.

B32ca—16 to 27 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong coarse prismatic structure; hard, firm, sticky and plastic; common fine tubular pores; common threadlike masses of lime; strongly effervescent; strongly alkaline; gradual wavy boundary.

C1ca—27 to 35 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, sticky and plastic; common fine tubular pores; common threadlike masses of lime; strongly effervescent; strongly alkaline; clear wavy boundary.

C2ca—35 to 47 inches; light brownish gray (2.5Y 6/2) sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine tubular pores; common threadlike masses of lime; strongly effervescent; strongly alkaline; clear wavy boundary.

C3ca—47 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, sticky and plastic; common fine tubular pores; common threadlike masses of lime; strongly effervescent; strongly alkaline.

The A2 horizon typically is silt loam, but in some pedons it is fine sandy loam or silty clay loam. The B2t horizon is silty clay, silty clay loam, or clay loam and is more than 35 percent clay. It is moderately alkaline to very strongly alkaline. The B3 and C horizons are strongly alkaline or very strongly alkaline. Texture is silty clay loam, clay, or clay loam in the B3 horizon and is mainly sandy clay loam or clay loam in the C horizon.

Adger Series

The Adger series consists of deep, well drained, slowly permeable, salt- and sodium-affected soils that formed in alluvium. These soils are on fans, terraces, and foot slopes of glaciated uplands. Slope is 0 to 8 percent.

These soils are fine, montmorillonitic Leptic Natriborolls.

Typical pedon of an Adger silty clay loam in an area of Adger-Absher complex, 0 to 8 percent slopes, in rangeland, 1,730 feet west and 250 feet south of the northeast corner of sec. 22, T. 24 N., R. 49 E.

A2—0 to 3 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; slightly effervescent; mildly alkaline; abrupt wavy boundary.

B21t—3 to 9 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; hard, firm, sticky and plastic; many fine roots; many fine tubular pores; common thin clay films on horizontal and vertical faces of peds; strongly effervescent; strongly alkaline; clear wavy boundary.

B22t—9 to 16 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; strong coarse prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; many fine roots; many fine tubular pores; many thick clay films on horizontal and vertical faces of peds; strongly effervescent; very strongly alkaline; clear wavy boundary.

B31tcacs—16 to 19 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak very coarse subangular blocky structure; hard, friable, sticky and plastic; many fine roots; common fine tubular pores; few faint clay films on vertical faces of peds; common faint lime coatings on vertical faces of peds; few fine and medium gypsum crystals; violently effervescent; very strongly alkaline; clear wavy boundary.

B32ca—19 to 27 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak very coarse subangular blocky structure; hard, friable, sticky and plastic; common fine roots; few fine tubular pores; common faint lime coatings on vertical faces of peds; violently effervescent; very strongly alkaline; gradual smooth boundary.

C1ca—27 to 38 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; few fine roots; few fine tubular pores; common faint lime coatings on vertical faces of peds; violently

effervescent; very strongly alkaline; gradual smooth boundary.

C2ca—38 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and plastic; few fine roots; common fine tubular pores; common faint lime coatings on vertical faces of peds; violently effervescent; very strongly alkaline.

The B2t horizon is strongly alkaline or very strongly alkaline. The B3 and C horizons are moderately alkaline to very strongly alkaline.

These soils are taxadjuncts to the Adger series because they are very strongly alkaline in the B2t horizon and they are silt loam below a depth of about 38 inches. These properties are outside the range of characteristics for the Adger series; they do not, however, significantly affect the use or management of these soils.

Alona Series

The Alona series consists of deep, well drained, moderately slowly permeable, salt- and sodium-affected soils that formed in alluvium. These soils are on fans and terraces. Slope is 0 to 15 percent.

These soils are fine-silty, mixed Borollic Camborthids.

Typical pedon of Alona silt loam, 0 to 8 percent slopes, in rangeland, 550 feet east and 1,900 feet south of the northwest corner of sec. 33, T. 19 N., R. 44 E.

A11—0 to 2 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; common fine continuous tubular pores; moderately alkaline; clear smooth boundary.

A12—2 to 5 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; common fine tubular pores; moderately alkaline; clear wavy boundary.

B2—5 to 13 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; strongly alkaline; clear wavy boundary.

B3ca—13 to 22 inches; light gray (2.5Y 7/2) silty clay loam, brown (10YR 5/3) moist; moderate medium and coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; violently effervescent; very strongly alkaline; clear wavy boundary.

C1saca—22 to 54 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure; slightly hard, friable, sticky and plastic; common fine roots; few fine tubular pores; many distinct lime coatings on horizontal and vertical faces of peds; many very fine salt crystals; strongly effervescent; very strongly alkaline; clear wavy boundary.

C2sa—54 to 60 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, sticky and plastic; many distinct lime coatings on horizontal and vertical faces of peds; many very fine salt crystals; strongly effervescent; very strongly alkaline.

The solum is 11 to 30 inches thick. The A horizon is neutral to moderately alkaline. The B2 horizon is moderately alkaline to very strongly alkaline. The B3 and C horizons are strongly alkaline or very strongly alkaline.

Banks Series

The Banks series consists of deep, excessively drained, rapidly permeable soils that formed in alluvium. These soils are on terraces and flood plains along the Missouri and Redwater Rivers. Slope is 0 to 2 percent.

These soils are sandy, mixed, frigid Typic Ustifluvents.

Typical pedon of Banks fine sandy loam in rangeland, 400 feet north and 2,640 feet east of the southwest corner of sec. 35, T. 21 N., R. 49 E.

A1—0 to 5 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; strongly effervescent; mildly alkaline; gradual wavy boundary.

C1—5 to 16 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; strongly effervescent; mildly alkaline; gradual wavy boundary.

IIC2—16 to 60 inches; light brownish gray (2.5Y 6/2) loamy fine sand, olive brown (2.5Y 4/4) moist; single grain; loose; few fine roots; strongly effervescent; mildly alkaline.

The C horizon is mildly alkaline or moderately alkaline. It has one or more very thin strata of very fine sandy loam or fine sandy loam.

Barkof Series

The Barkof series consists of moderately deep, well drained, slowly permeable soils that formed in residual material derived from semiconsolidated shale. These soils are on uplands. Slope is 2 to 45 percent.

These soils are fine, montmorillonitic, frigid Udorthentic Chromusterts.

Typical pedon of Barkof silty clay, 2 to 8 percent slopes, in cropland, 1,350 feet west and 75 feet south of the northeast corner of sec. 15, T. 20 N., R. 47 E.

Ap1—0 to 3 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure parting to moderate very fine and fine angular blocky; hard, friable, sticky and plastic; many fine roots; slightly effervescent; mildly alkaline; abrupt smooth boundary.
Ap2—3 to 7 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many fine roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.
B2—7 to 20 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; many fine roots; strongly effervescent; moderately alkaline; clear wavy boundary.
B3ca—20 to 26 inches; light olive gray (5Y 6/2) silty clay, olive gray (5Y 5/2) moist; moderate coarse prismatic structure; hard, firm, sticky and plastic; common fine roots between peds; common soft medium and coarse masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.
C1ca—26 to 29 inches; light gray (5Y 7/1) silty clay, light olive gray (5Y 6/2) moist; massive; hard, firm, sticky and plastic; few fine roots in cracks; few soft fine and medium masses of lime; slightly effervescent; moderately alkaline; gradual wavy boundary.
C2rcs—29 to 34 inches; light gray (5Y 7/1) semiconsolidated shale that crushes to silty clay, light olive gray (5Y 6/2) moist; very hard, firm, sticky and plastic; common fine roots in cracks and along bedding planes; few fine masses of gypsum crystals along bedding planes; mildly alkaline; gradual wavy boundary.
C3rcs—34 to 60 inches; white (5Y 8/1) semiconsolidated shale that crushes to silty clay, light olive gray (5Y 6/2) moist; very hard, firm, sticky and plastic; few fine masses of gypsum crystals along bedding planes; moderately alkaline.

Semiconsolidated shale is at a depth of 20 to 40 inches. The control section is silty clay or clay. When these soils are dry, cracks extend from the surface to a depth of 20 to 40 inches. The B horizon is silty clay or clay.

Bascovy Series

The Bascovy series consists of moderately deep, well drained, very slowly permeable soils that formed in material derived from consolidated shale. These soils are on knolls, side slopes, and foot slopes of hills of uplands. Slope is 2 to 25 percent.

These soils are fine, montmorillonitic, frigid Udorthentic Chromusterts.

Typical pedon of a Bascovy silty clay in an area of Bascovy-Sunburst complex, 15 to 45 percent slopes, in rangeland, 2,200 feet west and 1,960 feet south of the northeast corner of sec. 14, T. 26 N., R. 41 E.

A1—0 to 2 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate very fine angular blocky structure; hard, friable, sticky and plastic; many fine roots; slightly acid; clear wavy boundary.
B2—2 to 11 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium subangular blocky structure; very hard, firm, very sticky and very plastic; many fine roots; neutral; gradual wavy boundary.
C1—11 to 23 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, friable, sticky and plastic; common fine roots in cracks; 45 percent soft shale fragments; neutral; gradual smooth boundary.
C2r—23 to 47 inches; olive gray (5Y 5/2) consolidated shale, very dark gray (5Y 3/1) moist; strongly acid; clear smooth boundary.
C3r—47 to 62 inches; gray (5Y 5/1) consolidated shale, very dark gray (5Y 3/1) moist; strongly acid.

Consolidated shale is at a depth of 20 to 40 inches. The control section is clay or silty clay. When these soils are dry, cracks extend from the surface to a depth of 20 to 40 inches. The profile is mildly alkaline to slightly acid. The B horizon is clay or silty clay and in some pedons has as much as 25 percent soft shale fragments. The C horizon has as much as 50 percent soft shale fragments in the lower part. The Cr horizon is medium acid or strongly acid.

Benz Series

The Benz series consists of deep, well drained, slowly permeable, salt- and sodium-affected soils that formed in alluvium. These soils are on fans and terraces below sandstone and shale outcroppings. Slope is 0 to 8 percent.

These soils are fine-loamy, mixed (calcareous), frigid Ustic Torriorthents.

Typical pedon of Benz clay loam, 0 to 8 percent slopes, in rangeland, 1,020 feet east and 2,340 feet north of the southwest corner of sec. 23, T. 23 N., R. 43 E.

A1—0 to 1 inch; light brownish gray (2.5Y 6/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; slightly effervescent; strongly alkaline; clear wavy boundary.
C1—1 inch to 9 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive;

hard, friable, sticky and plastic; slightly effervescent; very strongly alkaline; clear wavy boundary.
C2casa—9 to 60 inches; grayish brown (2.5Y 5/2) stratified clay loam and fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; 5 percent pebbles; slightly effervescent; very strongly alkaline.

The 10- to 40-inch control section averages loam or clay loam. The A horizon is moderately alkaline or strongly alkaline. The C horizon is strongly alkaline or very strongly alkaline.

Blanchard Series

The Blanchard series consists of deep, excessively drained, rapidly permeable soils that formed in sandy eolian and alluvial material. These soils are in swales and on foot slopes and side slopes of uplands. Slope is 2 to 25 percent.

These soils are mixed, frigid Typic Ustipsamments.

Typical pedon of a Blanchard loamy sand in an area of Dast-Blanchard complex, 8 to 25 percent slopes, in rangeland, 700 feet north and 2,340 feet east of the southwest corner of sec. 16, T. 20 N., R. 46 E.

A1—0 to 7 inches; grayish brown (2.5Y 5/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; neutral; clear smooth boundary.
C1—7 to 18 inches; grayish brown (2.5Y 5/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; strongly effervescent; mildly alkaline; clear wavy boundary.
C2—18 to 36 inches; light brownish gray (2.5Y 6/2) loamy sand, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; strongly effervescent; mildly alkaline; clear wavy boundary.
IIC3—36 to 60 inches; light yellowish brown (2.5Y 6/4) loamy coarse sand, light olive brown (2.5Y 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; strongly effervescent; mildly alkaline.

The 10- to 40-inch control section is loamy fine sand to loamy coarse sand.

Bowbells Series

The Bowbells series consists of deep, well drained, moderately slowly permeable soils that formed in glacial till and local alluvium. These soils are in broad, nearly level basins, in swales, and on glaciated uplands. Slope is 0 to 2 percent.

These soils are fine-loamy, mixed Pachic Argiborolls.

Typical pedon of Bowbells loam, 0 to 2 percent slopes, in cropland, 1,100 feet east and 1,350 feet south of the northwest corner of sec. 30, T. 25 N., R. 50 E.

Ap1—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; abrupt smooth boundary.
Ap2—5 to 10 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; abrupt smooth boundary.
B1—10 to 18 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; clear wavy boundary.
B2t—18 to 28 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; common thin clay films on vertical faces of peds; mildly alkaline; clear wavy boundary.
B3ca—28 to 37 inches; light brownish gray (2.5Y 6/2) heavy loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure; hard, friable, sticky and plastic; common fine roots; common distinct lime coatings on vertical faces of peds; 5 percent pebbles that have common distinct lime coatings; strongly effervescent; moderately alkaline; clear wavy boundary.
C1ca—37 to 47 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky and plastic; common fine roots; common threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.
C2ca—47 to 60 inches; light gray (10YR 7/1) clay loam, grayish brown (10YR 5/2) moist; massive; hard, firm, sticky and plastic; few fine roots; common distinct lime coatings on vertical faces of peds; 5 percent pebbles; common threadlike masses of lime; strongly effervescent; moderately alkaline.

The mollic epipedon is 19 to 28 inches thick. The B1 and B2t horizons are loam or clay loam.

Brandenburg Series

The Brandenburg series consists of deep, excessively drained soils that are moderately permeable in the upper

part and very rapidly permeable in the lower part. These soils formed in material derived from shattered porcellanite and are on ridges and hills of uplands. Slope is 8 to 45 percent.

These soils are fragmental, mixed, frigid Typic Ustorthents.

Typical pedon of a Brandenburg channery loam in an area of Cabba-Brandenburg complex, 8 to 45 percent slopes, in rangeland, 200 feet north and 1,000 feet west of the southeast corner of sec. 9, T. 19 N., R. 49 E.

A1—0 to 5 inches; brown (7.5YR 5/2) channery loam, brown (7.5YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; 25 percent porcellanite fragments; slightly effervescent; mildly alkaline; clear smooth boundary.

C1ca—5 to 10 inches; brown (7.5YR 5/2) very channery loam, brown (7.5YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; 55 percent porcellanite fragments; many distinct white lime coatings on lower surfaces of fragments; violently effervescent; mildly alkaline; abrupt smooth boundary.

C2ca—10 to 60 inches; reddish yellow (5YR 6/6) shattered porcellanite; few fine roots in cracks; common distinct lime coatings on lower surfaces of fragments.

Depth to shattered porcellanite is 10 to 20 inches. The C1 horizon is channery loam or very channery loam.

Bryant Series

The Bryant series consists of deep, well drained, moderately permeable soils that formed in alluvium and in material derived from weakly consolidated sedimentary beds. These soils are on fans, terraces, and foot slopes of low hills of uplands. Slope is 0 to 8 percent.

These soils are fine-silty, mixed Typic Haploborolls.

Typical pedon of Bryant silt loam, 0 to 4 percent slopes, in rangeland, 1,025 feet east and 780 feet south of the northwest corner of sec. 28, T. 20 N., R. 46 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine roots; neutral; clear smooth boundary.

B1—4 to 9 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; neutral; clear wavy boundary.

B2—9 to 14 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.

B3ca—14 to 24 inches; light brownish gray (2.5Y 6/2) silty clay loam, olive brown (2.5Y 4/4) moist; moderate medium and coarse prismatic structure; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common threadlike masses of lime; violently effervescent; moderately alkaline; clear wavy boundary.

C1ca—24 to 48 inches; light gray (2.5Y 7/2) silty clay loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure; hard, very friable, sticky and plastic; common fine roots; many fine tubular pores; many threadlike masses of lime; violently effervescent; moderately alkaline; clear wavy boundary.

C2—48 to 60 inches; light yellowish brown (2.5Y 6/4) silty clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, very friable, sticky and plastic; few fine roots; many fine tubular pores; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 12 inches thick. The 10- to 40-inch control section is silt loam or silty clay loam and is 18 to 35 percent clay. The A horizon is neutral or mildly alkaline. The B horizon is silt loam or silty clay loam. The B1 and B2 horizons are neutral to moderately alkaline, and the B3 horizon is mildly alkaline or moderately alkaline. The C horizon is silt loam or silty clay loam.

Bryant Variant

Bryant Variant consists of deep, moderately well drained, salt-affected soils that formed in alluvium. These soils are on stream terraces. Slope is 0 to 2 percent.

These soils are fine-silty, mixed Typic Haploborolls.

Typical pedon of Bryant Variant silt loam, 0 to 2 percent slopes, in rangeland, 1,660 feet west and 2,400 feet south of the northeast corner of sec. 25, T. 22 N., R. 47 E.

Ap1sa—0 to 6 inches; dark grayish brown (2.5Y 4/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many fine roots; few medium masses of salt crystals; mildly alkaline; abrupt smooth boundary.

Ap2sa—6 to 10 inches; dark grayish brown (2.5Y 4/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many fine roots; common fine tubular pores; few medium

masses of salt crystals; strongly effervescent; moderately alkaline; clear wavy boundary.

B21sa—10 to 15 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; many fine roots; many fine tubular pores; few medium masses of salt crystals; violently effervescent; moderately alkaline; clear wavy boundary.

B22sa—15 to 20 inches; light brownish gray (2.5Y 6/2) silty clay loam, light brownish gray (2.5Y 6/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common fine and medium masses of salt crystals; violently effervescent; strongly alkaline; clear wavy boundary.

B23sa—20 to 24 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common medium masses of salt crystals; violently effervescent; strongly alkaline; clear wavy boundary.

C1sa—24 to 33 inches; light brownish gray (2.5Y 6/2) silt loam, olive (5Y 4/3) moist; weak coarse prismatic structure; slightly hard, friable, sticky and plastic; common fine roots; many fine tubular pores; few medium masses of salt crystals; violently effervescent; strongly alkaline; clear wavy boundary.

C2sa—33 to 42 inches; light gray (2.5Y 7/2) silty clay loam, olive (5Y 5/3) moist; massive; hard, firm, sticky and plastic; common fine roots; common fine tubular pores; many medium and coarse masses of salt crystals; violently effervescent; moderately alkaline; clear wavy boundary.

C3sa—42 to 60 inches; light gray (2.5Y 7/2) silty clay loam, olive (5Y 5/3) moist; few fine faint white mottles; massive; very hard, firm, sticky and plastic; few fine roots; common fine tubular pores; common medium and coarse masses of salt crystals; strongly effervescent; moderately alkaline.

Depth to a seasonal water table is 48 to 72 inches. Electrical conductivity is more than 8 millimhos per centimeter from the surface to a depth of about 42 inches.

Busby Series

The Busby series consists of deep, well drained, moderately rapidly permeable soils that formed in sandy alluvium. These soils are on fans, foot slopes, side slopes, and tops of low hills of uplands. Slope is 0 to 35 percent.

These soils are coarse-loamy, mixed Borollic Camborthids.

Typical pedon of Busby fine sandy loam, 2 to 8 percent slopes, in rangeland, 2,370 feet south and 1,580 feet east of the northwest corner of sec. 17, T. 17 N., R. 45 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and medium roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.

B2—5 to 11 inches; light olive brown (2.5Y 5/4) fine sandy loam, olive brown (2.5Y 4/4) moist; weak medium and coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; strongly effervescent; moderately alkaline; clear wavy boundary.

C1ca—11 to 26 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common distinct light gray lime coatings on sand and gravel; few sandstone fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

C2—26 to 60 inches; light brownish gray (2.5Y 6/2) fine sandy loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; moderately alkaline.

The B2 and B3 horizons, where present, are sandy loam or fine sandy loam. The C horizon is fine sandy loam or sandy loam.

Cabba Series

The Cabba series consists of shallow, well drained, moderately permeable soils that formed in material derived from weakly consolidated, sandy and silty sedimentary beds. These soils are on the sides and tops of hills and ridges of uplands. Slope is 4 to 45 percent.

These soils are loamy, mixed (calcareous), frigid, shallow Typic Ustorthents.

Typical pedon of a Cabba loam in an area of Cambert-Cabba loams, 8 to 15 percent slopes, in cropland, 1,200 feet west and 2,320 feet south of the northeast corner of sec. 8, T. 21 N., R. 47 E.

Ap—0 to 5 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.

C1—5 to 10 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly

hard, very friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

C2—10 to 15 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine tubular pores; common soft threadlike masses of lime; strongly effervescent; moderately alkaline; clear wavy boundary.

C3r—15 to 21 inches; pale yellow (5Y 7/3) weakly consolidated sedimentary beds that crush to silt loam, olive (5Y 5/3) moist; hard, friable, slightly sticky and slightly plastic; common fine roots in cracks and along bedding planes; strongly effervescent; moderately alkaline; gradual wavy boundary.

C4r—21 to 36 inches; pale yellow (5Y 7/4) weakly consolidated sandy sedimentary beds that crush to loam, olive (5Y 5/4) moist; very hard, friable, slightly sticky and slightly plastic; few fine roots in cracks and along bedding planes; strongly effervescent; moderately alkaline; gradual wavy boundary.

C5r—36 to 48 inches; pale yellow (5Y 7/4) weakly consolidated sedimentary beds that crush to silt loam, olive (5Y 5/4) moist; very hard, firm, slightly sticky and slightly plastic; few fine roots in cracks and along bedding planes; strongly effervescent; moderately alkaline; gradual wavy boundary.

C6r—48 to 60 inches; brownish yellow (10YR 6/6) weakly consolidated sedimentary beds that crush to loam, yellowish brown (10YR 5/6) moist; very hard, firm, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline.

Weakly consolidated, silty and sandy sedimentary beds are at a depth of 10 to 20 inches. The C horizon is loam, silt loam, or silty clay loam. It is moderately alkaline or strongly alkaline.

Cabbart Series

The Cabbart series consists of shallow, well drained, moderately permeable soils that formed in material derived from weakly consolidated, sandy and silty sedimentary beds. These soils are on side slopes, ridges, and tops of hills on uplands. Slope is 8 to 45 percent.

These soils are loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents.

Typical pedon of a Cabbart silt loam in an area of Cambeth-Cabbart silt loams, 8 to 15 percent slopes, in rangeland, 350 feet west and 1,650 feet south of the northeast corner of sec. 18, T. 21 N., R. 44 E.

A1—0 to 4 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak very fine and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine roots; violently effervescent; moderately alkaline; clear wavy boundary.

C1—4 to 13 inches; pale olive (5Y 6/3) silt loam, olive (5Y 5/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; violently effervescent; moderately alkaline; clear wavy boundary.

C2r—13 to 60 inches; pale yellow (5Y 7/3) weakly consolidated sandy and silty sedimentary beds, pale olive (5Y 6/3) moist; strata are mainly less than 6 inches thick; material crushes to silt loam to very fine sandy loam but dominantly to loam; slightly hard, very friable, slightly sticky and nonplastic; few roots in cracks and along bedding planes; violently effervescent; moderately alkaline.

Weakly consolidated sedimentary beds are at a depth of 10 to 20 inches. The C horizon averages silt loam but ranges from silty clay loam to very fine sandy loam.

Cambert Series

The Cambert series consists of moderately deep, well drained, moderately permeable soils that formed in material derived from weakly consolidated, silty sedimentary beds. These soils are on foot slopes and knolls of low hills on uplands. Slope is 2 to 15 percent.

These soils are fine-silty, mixed, frigid Typic Ustochrepts.

Typical pedon of Cambert loam, 2 to 8 percent slopes, in rangeland, 210 feet south and 120 feet west of the northeast corner of sec. 35, T. 19 N., R. 48 E.

A1—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; mildly alkaline; clear smooth boundary.

B21—4 to 9 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate coarse subangular blocky structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; moderately alkaline; clear smooth boundary.

B22—9 to 13 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; slightly effervescent; moderately alkaline; gradual wavy boundary.

C1ca—13 to 26 inches; very pale brown (10YR 7/4) silty clay loam, light yellowish brown (2.5Y 6/4) moist; weak fine and medium angular blocky structure; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; many soft fine

masses of lime; violently effervescent; moderately alkaline; gradual smooth boundary.

C2r—26 to 38 inches; pale yellow (2.5Y 7/4) weakly consolidated sedimentary beds that crush to silt, light olive brown (2.5Y 5/4) moist; hard, friable, sticky and plastic; common fine and very fine roots in cracks and along bedding planes; common fine tubular pores; strongly effervescent; strongly alkaline; abrupt smooth boundary.

C3r—38 to 45 inches; light gray (2.5Y 7/2) weakly consolidated sedimentary beds that crush to very fine sandy loam, grayish brown (2.5Y 5/2) moist; slightly hard, friable, nonsticky and nonplastic; few fine roots in cracks and along bedding planes; few fine tubular pores; strongly effervescent; strongly alkaline; abrupt smooth boundary.

C4r—45 to 54 inches; light gray (2.5Y 7/2) weakly consolidated sedimentary beds that crush to silt, grayish brown (2.5Y 5/2) moist; hard, friable, slightly sticky and slightly plastic; few fine roots in cracks and along bedding planes; few fine tubular pores; strongly effervescent; strongly alkaline; gradual smooth boundary.

C5r—54 to 60 inches; light gray (2.5Y 7/2) weakly consolidated sedimentary beds that crush to silt loam, grayish brown (2.5Y 5/2) moist; hard, friable, nonsticky and nonplastic; few very fine roots in cracks and along bedding planes; strongly effervescent; strongly alkaline.

Weakly consolidated sedimentary beds are at a depth of 20 to 40 inches. The B horizon is loam or silt loam.

Cambeth Series

The Cambeth series consists of moderately deep, well drained, moderately permeable soils that formed in material derived from weakly consolidated, silty sedimentary beds. These soils are on foot slopes, side slopes, and tops of hills on uplands. Slope is 0 to 15 percent.

These soils are fine-silty, mixed, Borollic Camborthids.

Typical pedon of Cambeth silt loam, 2 to 8 percent slopes, in rangeland, 1,200 feet east and 600 feet north of the southwest corner of sec. 36, T. 19 N., R. 43 E.

A11—0 to 3 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to weak fine granular; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; neutral; clear smooth boundary.

A12—3 to 6 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, nonsticky and nonplastic; many fine roots; many fine tubular pores; mildly alkaline; clear smooth boundary.

B2—6 to 11 inches; light yellowish brown (10YR 6/4) silt loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure parting to moderate medium angular blocky; hard, firm, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; strongly effervescent; mildly alkaline; clear smooth boundary.

B3ca—11 to 13 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure parting to weak medium angular blocky; hard, firm, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; few soft threadlike masses of lime; violently effervescent; strongly alkaline; gradual smooth boundary.

C1ca—13 to 35 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; few soft threadlike masses of lime; violently effervescent; strongly alkaline; gradual smooth boundary.

C2r—35 to 60 inches; white (10YR 8/1) weakly consolidated sedimentary beds that crush to silty clay loam, light gray (10YR 6/1) moist; slightly hard, friable, sticky and slightly plastic; few fine roots in cracks and along bedding planes; common fine tubular pores; violently effervescent; strongly alkaline.

Weakly consolidated, silty sedimentary beds are at a depth of 20 to 40 inches. The B horizon is silt loam or loam. The C horizon is silt loam or silty clay loam.

Cherry Series

The Cherry series consists of deep, well drained, moderately slowly permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 4 percent.

These soils are fine-silty, mixed, frigid Typic Ustochrepts.

Typical pedon of Cherry silt loam, 0 to 4 percent slopes, in rangeland, 100 feet east and 2,480 feet north of the southwest corner of sec. 21, T. 19 N., R. 48 E.

A1—0 to 3 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.

B21—3 to 8 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; common fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.

B22—8 to 17 inches; pale yellow (2.5Y 7/4) silt loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.

B3ca—17 to 24 inches; light brownish gray (2.5Y 6/2) silt loam, olive brown (2.5Y 4/4) moist; moderate coarse prismatic structure; slightly hard, very friable, sticky and plastic; many fine roots; many fine tubular pores; violently effervescent; moderately alkaline; clear wavy boundary.

C1ca—24 to 39 inches; pale yellow (2.5Y 7/4) silt loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; common fine tubular pores; common firm threadlike masses of lime; violently effervescent; moderately alkaline; clear wavy boundary.

C2—39 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; many fine tubular pores; few threadlike masses of lime; strongly effervescent; strongly alkaline.

The 10- to 40-inch control section is silt loam or silty clay loam and is 18 to 35 percent clay. The B and C horizons are silt loam or silty clay loam.

Chinook Series

The Chinook series consists of deep, well drained, moderately rapidly permeable soils that formed in alluvial and eolian material. These soils are on fans, terraces, and foot slopes of hills on uplands. Slope is 0 to 15 percent.

These soils are coarse-loamy, mixed Aridic Haploborolls.

Typical pedon of Chinook fine sandy loam, 4 to 8 percent slopes, in rangeland, 1,580 feet north and 1,600 feet east of the southwest corner of sec. 26, T. 21 N., R. 43 E.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine roots; neutral; clear smooth boundary.

B21—6 to 13 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many fine roots; mildly alkaline; clear wavy boundary.

B22—13 to 18 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

B3ca—18 to 29 inches; light brownish gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure; soft, very friable, nonsticky and nonplastic; common fine roots; common distinct white lime coatings on faces of peds; common thick white lime coatings on sand grains and pebbles; 5 percent soft sandstone pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

C1ca—29 to 42 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; soft, very friable, nonsticky and nonplastic; common fine roots; common distinct white lime coatings on sand grains and pebbles; 5 percent soft sandstone pebbles; violently effervescent; moderately alkaline; gradual irregular boundary.

C2ca—42 to 60 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common distinct lime coatings on sand grains and pebbles; 5 percent soft sandstone pebbles; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 13 inches thick. The B2 and B3 horizons are fine sandy loam or sandy loam. The C horizon is sandy loam or loamy fine sand.

Creed Series

The Creed series consists of deep, well drained, slowly permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 8 percent.

These soils are fine, montmorillonitic Borollic Natrargids.

Typical pedon of a Creed loam in an area of Creed-Gerdrum complex, 0 to 8 percent slopes, in rangeland, 1,970 feet east and 55 feet north of the southwest corner of sec. 19, T. 21 N., R. 45 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, sticky and slightly plastic; many fine roots; mildly alkaline; abrupt smooth boundary.

A21—3 to 6 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak thin platy structure; slightly hard, friable, sticky and plastic; many fine roots; many fine vesicular pores; common fine tubular pores; moderately alkaline; clear smooth boundary.

A22—6 to 8 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak

medium subangular blocky structure; slightly hard, friable, sticky and plastic; many fine roots; many fine vesicular pores; moderately alkaline; abrupt wavy boundary.

B2tca—8 to 24 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; strong medium columnar structure parting to moderate medium subangular blocky; very hard, firm, very sticky and plastic; many fine roots; many fine tubular pores; many fine vesicular pores; common thin clay films on horizontal and vertical faces of peds; common distinct lime coatings on horizontal and vertical faces of peds; 5 percent pebbles; common threadlike masses of lime; strongly effervescent; strongly alkaline; gradual smooth boundary.

C1ca—24 to 42 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak very coarse subangular blocky structure; very hard, firm, very sticky and plastic; few fine roots; common fine vesicular pores; few distinct lime coatings on horizontal and vertical faces of peds; common distinct lime coatings on lower surfaces of fragments; 5 percent pebbles; common threadlike masses of lime; strongly effervescent; strongly alkaline; diffuse smooth boundary.

C1ca—42 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak very coarse subangular blocky structure; very hard, firm, sticky and plastic; few fine roots; few fine tubular pores; common distinct lime coatings on lower surfaces of fragments; 5 percent pebbles; strongly effervescent; strongly alkaline.

The A horizon is neutral to moderately alkaline. The B2t horizon is moderately alkaline or strongly alkaline. The B3 horizon, where present, and the C horizon are clay loam, silty clay, or silty clay loam and are moderately alkaline or strongly alkaline.

Dast Series

The Dast series consists of moderately deep, well drained, moderately rapidly permeable soils that formed in material derived from weakly consolidated, sandy sedimentary beds. These soils are on uplands. Slope is 0 to 45 percent.

These soils are coarse-loamy, mixed (calcareous), frigid Typic Ustorthents.

Typical pedon of a Dast fine sandy loam in an area of Cambert-Dast-Cabba complex, 4 to 15 percent slopes, in rangeland, 400 feet north and 150 feet west of the southeast corner of sec. 3, T. 22 N., R. 47 E.

A1—0 to 3 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine roots; common fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.

C1—3 to 9 inches; brown (10YR 5/3) fine sandy loam, dark grayish brown (10YR 4/3) moist; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; soft, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; 5 percent soft pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—9 to 17 inches; very pale brown (10YR 7/3) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; 5 percent soft pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

C3—17 to 25 inches; light gray (2.5Y 7/2) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, friable, nonsticky and nonplastic; common fine roots; many fine tubular pores; 20 percent soft pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C4r—25 to 60 inches; pale yellow (5Y 7/3) weakly consolidated sandy sedimentary beds that crush to fine sandy loam, pale olive (5Y 6/4) moist; slightly hard, friable, nonsticky and nonplastic; few fine roots in cracks and along bedding planes; strongly effervescent; moderately alkaline.

Weakly consolidated, sandy sedimentary beds are at a depth of 20 to 40 inches. The C horizon is fine sandy loam or sandy loam.

Dimmick Series

The Dimmick series consists of deep, very poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are in large basins and lakebeds on uplands and in oxbows along the Missouri River. Slope is 0 to 1 percent.

These soils are fine, montmorillonitic, frigid Typic Haplaquolls.

Typical pedon of Dimmick silty clay in rangeland, 2,360 feet east and 1,260 feet north of the southwest corner of sec. 10, T. 26 N., R. 43 E.

A11g—0 to 1 inch; gray (5Y 5/1) silty clay, very dark gray (5Y 3/1) moist; common medium distinct yellow (2.5Y 7/6) mottles; many medium distinct dark gray (5Y 4/1) mottles; moderate medium platy structure; hard, friable, very sticky and very plastic; many fine roots; mildly alkaline; abrupt smooth boundary.

A12g—1 inch to 7 inches; gray (5Y 5/1) silty clay, very dark gray (5Y 3/1) moist; many fine and medium distinct dark gray (5Y 4/1) mottles; moderate very fine and fine subangular blocky structure; hard,

friable, sticky and plastic; many fine roots; mildly alkaline; clear wavy boundary.

C1g—7 to 28 inches; gray (5Y 5/1) silty clay, dark olive gray (5Y 3/2) moist; common fine and medium distinct very dark gray (5Y 3/1) mottles; strong fine subangular blocky structure; very hard, friable, sticky and very plastic; common fine roots; moderately alkaline; gradual wavy boundary.

C2g—28 to 60 inches; olive gray (5Y 5/2) silty clay, dark olive gray (5Y 3/2) moist; common fine and medium distinct dark gray (5Y 4/1) mottles; massive; very hard, firm, very sticky and very plastic; slightly effervescent; moderately alkaline.

The profile is clay or silty clay throughout. Some pedons have a few thin lenses of clay loam.

Ethridge Series

The Ethridge series consists of deep, well drained, slowly permeable soils that formed in alluvium. These soils are on terraces and fans of uplands. Slope is 0 to 8 percent.

These soils are fine, montmorillonitic Aridic Argiborolls.

Typical pedon of Ethridge silty clay loam, 4 to 8 percent slopes, in rangeland, 2,590 feet north and 2,440 feet east of the southwest corner of sec. 1, T. 21 N., R. 44 E.

A1—0 to 3 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium and coarse subangular blocky structure parting to moderate fine and medium granular; slightly hard, friable, sticky and plastic; many fine and medium roots; many fine and medium tubular pores; mildly alkaline; clear wavy boundary.

B2t—3 to 11 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; many thin very dark grayish brown (10YR 3/2) clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.

B3ca—11 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; hard, firm, sticky and plastic; many fine roots; many fine tubular pores; many threadlike masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1ca—33 to 60 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; few fine roots; many fine tubular pores; many threadlike masses of lime; violently effervescent; moderately alkaline.

The mollic epipedon is 7 to 13 inches thick. The B2t horizon is silty clay loam or silty clay. The C horizon is silty clay loam or silty clay and has thin strata of very fine sandy loam or silt loam.

Evanston Series

The Evanston series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on terraces and fans of uplands. Slope is 0 to 8 percent.

These soils are fine-loamy, mixed Aridic Argiborolls.

Typical pedon of Evanston loam, 0 to 2 percent slopes, in cropland, 1,200 feet south and 2,035 feet west of the northeast corner of sec. 17, T. 25 N., R. 44 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; many fine roots; neutral; clear smooth boundary.

B21t—8 to 15 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to strong medium angular blocky; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common thin very dark grayish brown (10YR 3/2) clay films on horizontal and vertical faces of peds; neutral; gradual wavy boundary.

B22t—15 to 26 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure parting to strong medium and coarse angular blocky; hard, friable, sticky and plastic; common fine roots; many fine continuous tubular pores; common thin clay films on horizontal and vertical faces of peds; neutral; clear wavy boundary.

C1ca—26 to 52 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; few fine roots; many soft medium and coarse masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2ca—52 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine roots; many soft fine and medium masses of lime; violently effervescent; strongly alkaline.

The mollic epipedon is 11 to 15 inches thick. The B2t horizon is neutral or mildly alkaline. The C horizon is sandy loam to clay loam.

Farland Series

The Farland series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 4 percent.

These soils are fine-silty, mixed Typic Argiborolls.

Typical pedon of Farland silt loam, 0 to 4 percent slopes, in rangeland, 1,575 feet north and 1,600 feet west of the southeast corner of sec. 25, T. 19 N., R. 46 E.

A11—0 to 2 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; neutral; abrupt smooth boundary.

A12—2 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; neutral; clear wavy boundary.

B2t—4 to 15 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; many fine roots; many fine tubular pores; many thin clay films on horizontal and vertical faces of peds; mildly alkaline; clear wavy boundary.

B3ca—15 to 30 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common threadlike masses of lime; strongly effervescent; moderately alkaline; clear wavy boundary.

C1—30 to 40 inches; light gray (2.5Y 7/2) silt loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure; slightly hard, very friable, sticky and plastic; many fine roots; many fine tubular pores; many fine vesicular pores; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2—40 to 60 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, sticky and plastic; few fine roots; common fine tubular pores; many fine vesicular pores; slightly effervescent; moderately alkaline.

Thickness of the mollic epipedon is 12 to 15 inches. Depth to carbonates is 17 to 26 inches. The B3ca horizon is silt loam or silty clay loam.

Farnuf Series

The Farnuf series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 4 percent.

These soils are fine-loamy, mixed Typic Argiborolls.

Typical pedon of Farnuf loam, 0 to 4 percent slopes, in cropland, 800 feet west and 550 feet south of the northeast corner of sec. 24, T. 17 N., R. 49 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine roots; common very fine tubular pores; neutral; clear smooth boundary.

B2t—6 to 15 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; common thin clay films on faces of peds; neutral; gradual wavy boundary.

B3—15 to 24 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable, sticky and slightly plastic; common very fine roots; many very fine tubular pores; slightly effervescent; mildly alkaline; gradual wavy boundary.

C1ca—24 to 42 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; weak very coarse prismatic structure; slightly hard, very friable, sticky and slightly plastic; common very fine roots; many very fine tubular pores; many soft fine masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2—42 to 60 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; violently effervescent; moderately alkaline.

The mollic epipedon is 14 or 15 inches thick. Depth to carbonates is 10 to 15 inches. The A horizon is neutral or mildly alkaline. The B2t horizon is neutral to moderately alkaline. The B3 and C horizons are clay loam or loam.

Fleak Series

The Fleak series consists of shallow, somewhat excessively drained, rapidly permeable soils that formed in material derived from weakly consolidated, sandy sedimentary beds. These soils are on uplands. Slope is 2 to 45 percent.

These soils are mixed, frigid, shallow Typic Torripsamments.

Typical pedon of a Fleak loamy sand in an area of Busby-Fleak complex, 15 to 45 percent slopes, in

rangeland, 1,655 feet south and 475 feet east of the northwest corner of sec. 7, T. 25 N., R. 43 E.

A11—0 to 3 inches; olive brown (2.5Y 4/4) sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many fine roots; 5 percent soft pebbles; slightly effervescent; neutral; clear wavy boundary.

A12—3 to 6 inches; light olive brown (2.5Y 5/4) loamy sand, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; soft, very friable; many fine roots; 5 percent soft pebbles; slightly effervescent; neutral; gradual wavy boundary.

C1—6 to 16 inches; olive (5Y 5/3) loamy sand, olive (5Y 4/3) moist; weak medium subangular blocky structure; soft, very friable; many fine roots; 5 percent soft pebbles; slightly effervescent; mildly alkaline; gradual wavy boundary.

C2r—16 to 35 inches; light olive gray (5Y 6/2) weakly consolidated sedimentary beds that crush to loamy sand, olive (5Y 4/3) moist; slightly hard, very friable; few fine roots in cracks and along bedding planes; slightly effervescent; mildly alkaline; gradual wavy boundary.

C3r—35 to 60 inches; light olive brown (2.5Y 5/4) weakly consolidated sedimentary beds that crush to loamy sand, olive brown (2.5Y 4/4) moist; slightly hard, very friable; slightly effervescent; mildly alkaline.

Weakly consolidated, sandy sedimentary beds are at a depth of 10 to 20 inches.

Floweree Series

The Floweree series consists of deep, well drained, moderately slowly permeable soils that formed in alluvium. They are on fans and terraces of uplands. Slope is 0 to 8 percent.

These soils are fine-silty, mixed Aridic Haploborolls.

Typical pedon of Floweree silt loam, 0 to 4 percent slopes, in rangeland, 500 feet south and 500 feet east of the northwest corner of sec. 16, T. 16 N., R. 46 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to weak fine granular; slightly hard, friable, sticky and plastic; many fine roots; many fine pores; moderately alkaline; clear smooth boundary.

B21—2 to 6 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; strong medium and coarse prismatic structure parting to strong medium subangular blocky; hard, very friable, sticky and plastic; many fine roots; many fine tubular pores; moderately alkaline; clear smooth boundary.

B22—6 to 10 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; strong medium and coarse prismatic structure parting to strong medium subangular blocky; slightly hard, very friable, sticky and plastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

B23ca—10 to 15 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; few threadlike masses of lime; violently effervescent; strongly alkaline; gradual smooth boundary.

C1ca—15 to 20 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; few threadlike masses of lime; violently effervescent; strongly alkaline; gradual smooth boundary.

C2—20 to 37 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; violently effervescent; strongly alkaline; gradual smooth boundary.

C3cs—37 to 60 inches; grayish brown (10YR 5/2) silty clay loam, brown (10YR 4/3) moist; massive; very hard, friable, sticky and plastic; common threadlike masses of gypsum; slightly effervescent; moderately alkaline.

The B horizon is silt loam, silty clay loam, or clay loam. The C horizon is loam, silt loam, or silty clay loam.

Gerdrum Series

The Gerdrum series consists of deep, well drained, slowly permeable, salt- and sodium-affected soils that formed in alluvium. These soils are on fans, terraces, and foot slopes of uplands. Slope is 0 to 15 percent.

These soils are fine, montmorillonitic Borollic Natrargids.

Typical pedon of Gerdrum clay loam, 0 to 8 percent slopes, in rangeland, 1,700 feet north and 2,110 feet east of the southwest corner of sec. 8, T. 26 N., R. 42 E.

A2—0 to 2 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate fine platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine and medium vesicular pores; neutral; clear smooth boundary.

B21t—2 to 4 inches; light brownish gray (2.5Y 6/2) heavy clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium columnar structure parting to

strong medium angular blocky; very hard, firm, very sticky and plastic; many fine roots; many fine tubular pores; common thin dark grayish brown (10YR 4/2) clay films on vertical faces of peds; 5 percent pebbles; moderately alkaline; clear wavy boundary.

B22t—4 to 7 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine roots; many fine tubular pores; many thin clay films on horizontal and vertical faces of peds; mildly alkaline; gradual wavy boundary.

B23tca—7 to 11 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; strong medium and coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine roots; many fine tubular pores; common thin clay films on vertical faces of peds; common fine and medium soft masses of lime; strongly effervescent; strongly alkaline; gradual wavy boundary.

B3ca—11 to 20 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure parting to moderate coarse angular blocky; hard, firm, very sticky and plastic; common fine roots; many fine tubular pores; common soft medium masses of lime; violently effervescent; strongly alkaline; gradual wavy boundary.

C1cs—20 to 54 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and plastic; few fine roots; common fine gypsum crystals; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2cssa—54 to 60 inches; pale olive (5Y 6/3) clay loam, olive (5Y 5/3) moist; massive; hard, friable, very sticky and plastic; few fine roots; many fine gypsum crystals; many soft medium masses of salt crystals; moderately alkaline.

The B2t horizon is dominantly clay, but in some pedons it is clay loam or silty clay. It is moderately alkaline or strongly alkaline. The C horizon commonly is clay loam or clay, but some pedons have thin strata of fine sandy loam.

Glendive Series

The Glendive series consists of deep, well drained, moderately rapidly permeable soils that formed in alluvium. These soils are on fans, terraces, and flood plains in valleys. Slope is 0 to 2 percent.

These soils are coarse-loamy, mixed (calcareous), frigid Ustic Torrifluvents.

Typical pedon of Glendive loam, 0 to 2 percent slopes, in rangeland, 50 feet south and 1,900 feet east of the northwest corner of sec. 35, T. 21 N., R. 43 E.

A1—0 to 6 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.

C1—6 to 60 inches; grayish brown (10YR 5/2) stratified fine sandy loam and loamy fine sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; moderately alkaline.

The A horizon is sandy loam, loam, or silty clay loam and is mildly alkaline or moderately alkaline. The horizon is 4 to 7 inches thick. It is less than 5 percent finely divided lime. The C horizon is mildly alkaline to strongly alkaline.

Hanly Series

The Hanly series consists of deep, somewhat excessively drained, rapidly permeable soils that formed in recent, stratified, sandy alluvium. These soils are on stream terraces and flood plains. Slope is 0 to 2 percent.

These soils are sandy, mixed, frigid Ustic Torrifluvents.

Typical pedon of Hanly loamy fine sand in rangeland, 3,310 feet west and 780 feet north of the southeast corner of sec. 26, T. 27 N., R. 41 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

C1—4 to 60 inches; light brownish gray (10YR 6/2) loamy fine sand with a few 1-inch thick strata of loam, dark grayish brown (10YR 4/2) moist; single grain; loose; few fine roots; slightly effervescent; moderately alkaline.

The 10- to 40-inch control section averages loamy sand or loamy fine sand. The profile is neutral to moderately alkaline.

Harlem Series

The Harlem series consists of deep, well drained, slowly permeable soils that formed in alluvium. These soils are on terraces and flood plains in valleys. Slope is 0 to 2 percent.

These soils are fine, montmorillonitic (calcareous), frigid Ustic Torrifluvents.

Typical pedon of Harlem silty clay, protected, in cropland, 15 feet west and 2,640 feet south of the northeast corner of sec. 10, T. 26 N., R. 43 E.

Ap—0 to 5 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.
C1—5 to 23 inches; light brownish gray (2.5Y 6/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate fine subangular blocky structure; very hard, very firm, very sticky and very plastic; common fine roots; slightly effervescent; moderately alkaline; gradual wavy boundary.
C2—23 to 60 inches; grayish brown (2.5Y 5/2) silty clay with thin strata of silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; slightly effervescent; moderately alkaline.

The profile is mildly alkaline or moderately alkaline. The A horizon is less than 5 percent finely divided lime. The C horizon is clay or silty clay and has thin strata of silty clay loam, silt loam, or loam.

Havre Series

The Havre series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on terraces and flood plains in valleys. Slope is 0 to 2 percent.

These soils are fine-loamy, mixed (calcareous), frigid Ustic Torrifluvents.

Typical pedon of Havre silt loam in rangeland, 1,180 feet east and 200 feet north of the southwest corner of sec. 31, T. 17 N., R. 45 E.

A1—0 to 5 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium platy structure; hard, friable, slightly sticky and slightly plastic; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.
C1—5 to 60 inches; light brownish gray (2.5Y 6/2) silt loam and thin strata of fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent; moderately alkaline.

The profile is mildly alkaline or moderately alkaline. The A horizon is silt loam or silty clay loam. It is less than 5 percent finely divided lime. The C horizon is loam or silt loam. In some pedons it has thin strata of loamy sand, coarse sand, fine sandy loam, or silty clay loam.

Havrelon Series

The Havrelon series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on stream terraces and flood plains in valleys. Slope is 0 to 2 percent.

These soils are fine-loamy, mixed (calcareous), frigid Typic Ustifluvents.

Typical pedon of Havrelon loam in rangeland, 1,680 feet south and 600 feet east of the northwest corner of sec. 12, T. 20 N., R. 49 E.

A1—0 to 5 inches; pale brown (10YR 6/3) loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; mildly alkaline; clear wavy boundary.
C1—5 to 60 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; mildly alkaline.

The A horizon is loam or silty clay loam. It is less than 5 percent finely divided lime. The C horizon is mainly very fine sandy loam or loam.

Hillon Series

The Hillon series consists of deep, well drained, slowly permeable soils that formed in glacial till. These soils are on glaciated uplands. Slope is 2 to 45 percent.

These soils are fine-loamy, mixed (calcareous), frigid Ustic Torriorthents.

Typical pedon of a Hillon loam in an area of Telstad-Hillon loams, 2 to 8 percent slopes, in rangeland, 40 feet west and 2,500 feet north of the southeast corner of sec. 17, T. 25 N., R. 44 E.

A11—0 to 5 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate very fine and fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; slightly effervescent; mildly alkaline; clear wavy boundary.
A12—5 to 7 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; 5 percent pebbles; few soft fine masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.
C1ca—7 to 27 inches; light gray (5Y 7/2) loam, olive (5Y 5/3) moist; massive; hard, friable, sticky and slightly plastic; many fine roots; common fine tubular pores; 5 percent pebbles; many soft coarse masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.
C2ca—27 to 38 inches; light gray (5Y 7/2) loam, olive (5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine roots; 5 percent pebbles; common soft medium masses of lime; strongly effervescent; strongly alkaline; gradual wavy boundary.

C3ca—38 to 60 inches; pale yellow (5Y 7/3) loam, olive (5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; 5 percent pebbles; few soft fine and medium masses of lime; strongly effervescent; strongly alkaline.

The A horizon is mildly alkaline or moderately alkaline. The C horizon is moderately alkaline or strongly alkaline.

Hoffmanville Series

The Hoffmanville series consists of deep, well drained, slowly permeable soils that formed in alluvium. These soils are on terraces of the Missouri River. Slope is 0 to 2 percent.

These soils are clayey over sandy or sandy-skeletal, montmorillonitic (calcareous), frigid Typic Ustifluvents.

Typical pedon of Hoffmanville silty clay, protected, in cropland, 2,450 feet south and 100 feet east of the northwest corner of sec. 26, T. 27 N., R. 47 E.

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, very sticky and very plastic; few very fine roots; mildly alkaline; slightly effervescent; abrupt smooth boundary.

C1—5 to 12 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, very sticky and very plastic; many very fine roots; common very fine tubular pores; mildly alkaline; slightly effervescent; clear wavy boundary.

C2—12 to 28 inches; grayish brown (2.5Y 5/2) silty clay and thin strata of silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, very sticky and very plastic; common very fine roots; many very fine tubular pores; mildly alkaline; slightly effervescent; clear smooth boundary.

IIC3—28 to 60 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few very fine roots; mildly alkaline; slightly effervescent.

The C horizon is clay or silty clay. Depth to the sandy IIC horizon is 20 to 30 inches.

Kirby Series

The Kirby series consists of deep, well drained, rapidly permeable soils that formed in sandstone and shale. These soils are on upper side slopes and ridges of hills on uplands. Slope is 8 to 45 percent.

These soils are fragrnental, mixed (calcareous), frigid Ustic Torriorthents.

Typical pedon of a Kirby very channery loam in an area of Cabbart-Kirby complex, 8 to 45 percent slopes, in rangeland, 1,576 feet east and 865 feet north of the southwest corner of sec. 6, T. 21 N., R. 46 E.

A1—0 to 5 inches; light brown (7.5YR 6/4) very channery loam, brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; 40 percent coarse fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

C1ca—5 to 14 inches; light brown (7.5YR 6/4) very channery loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; 45 percent coarse fragments; violently effervescent; moderately alkaline; clear smooth boundary.

C2ca—14 to 18 inches; light brown (7.5YR 6/4) extremely channery loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine roots in cracks; 75 percent coarse fragments; common distinct lime coatings on lower surfaces of fragments; violently effervescent; moderately alkaline; clear smooth boundary.

C3ca—18 to 60 inches; light brown (7.5YR 6/4) baked sandstone and shale fragments; few fine roots in cracks; common distinct lime coatings on undersides of coarse fragments in upper 10 inches; strongly effervescent.

Depth to fragmental material is 10 to 20 inches.

Kremlin Series

The Kremlin series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 8 percent.

These soils are fine-loamy, mixed Aridic Haploborolls.

Typical pedon of Kremlin loam, 0 to 4 percent slopes, in rangeland, 1,375 feet west and 1,180 feet south of the northeast corner of sec. 15, T. 18 N., R. 45 E.

A11—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; mildly alkaline; clear wavy boundary.

A12—2 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; slightly hard, friable, nonsticky and nonplastic; common fine and medium roots; many fine tubular pores; neutral; gradual wavy boundary.

B2—6 to 10 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common fine and medium

roots; common fine tubular pores; mildly alkaline; clear wavy boundary.

B3ca—10 to 13 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.

C1ca—13 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak very coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; few fine tubular pores; common lime coatings in pores; violently effervescent; moderately alkaline; gradual wavy boundary.

C2—18 to 60 inches; light gray (10YR 7/2) loam with thin strata of fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; violently effervescent; moderately alkaline.

The mollic epipedon is 10 to 12 inches thick.

Lehr Series

The Lehr series consists of deep, somewhat excessively drained soils that formed in alluvium. Permeability is moderately rapid in the upper part of these soils and very rapid in the lower part. These soils are on stream terraces and outwash plains. Slope is 2 to 8 percent.

These soils are fine-loamy over sandy or sandy-skeletal, mixed Typic Haploborolls.

Typical pedon of Lehr loam, 2 to 8 percent slopes, in rangeland, 2,200 feet east and 1,495 feet north of the southwest corner of sec. 13, T. 17 N., R. 48 E.

A1—0 to 4 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; 5 percent pebbles; neutral; clear wavy boundary.

B2—4 to 8 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; 5 percent pebbles; neutral; clear wavy boundary.

B3ca—8 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; 5 percent pebbles; common distinct lime coatings on lower surfaces of fragments; common threadlike masses of lime; violently effervescent; moderately alkaline; clear wavy boundary.

IIC1ca—18 to 60 inches; very pale brown (10YR 7/3) very gravelly fine sand, pale brown (10YR 6/3) moist; single grain; loose; few fine roots; 60 percent pebbles; many lime coatings on lower surfaces of fragments; violently effervescent; moderately alkaline.

The mollic epipedon is 7 to 14 inches thick. Depth to carbonates is 7 to 14 inches. Depth to very gravelly or extremely gravelly material is 14 to 20 inches. The B2 horizon is mildly alkaline or moderately alkaline. The IIC* horizon is very gravelly or extremely gravelly loamy sand, loamy fine sand, or fine sand. It has thin strata of sand or coarse sandy loam.

Lisk Series

The Lisk series consists of deep, somewhat excessively drained, moderately rapidly permeable soils that formed in eolian material and alluvium derived from soft sandstone. These soils are in swales and depressional areas on foot slopes and side slopes of hills. Slope is 2 to 15 percent.

These soils are coarse-loamy, mixed, frigid Typic Ustochrepts.

Typical pedon of Lisk sandy loam, 2 to 8 percent slopes, in rangeland, 1,580 feet east and 50 feet south of the northwest corner of sec. 13, T. 20 N., R. 46 E.

A1—0 to 5 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

B2—5 to 15 inches; light brownish gray (2.5Y 6/2) sandy loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure; soft, very friable, nonsticky and nonplastic; common fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

C1ca—15 to 30 inches; pale olive (5Y 6/3) sandy loam, olive (5Y 4/4) moist; weak coarse prismatic structure; soft, very friable, nonsticky and nonplastic; common fine roots; strongly effervescent; moderately alkaline; clear wavy boundary.

C2ca—30 to 41 inches; pale olive (5Y 6/3) sandy loam, olive (5Y 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; moderately alkaline; gradual irregular boundary.

C3—41 to 60 inches; light gray (5Y 7/2) loamy sand, light olive gray (5Y 6/2) moist; single grain; loose; few fine roots; slightly effervescent; moderately alkaline.

The 10- to 40-inch control section is sandy loam or fine sandy loam.

Lohler Series

The Lohler series consists of deep, moderately well drained, moderately slowly permeable soils that formed in alluvium. These soils are on terraces and flood plains in valleys. Slope is 0 to 2 percent.

These soils are fine, montmorillonitic (calcareous), frigid Typic Ustifluvents.

Typical pedon of Lohler silty clay loam, protected, in cropland, 50 feet west and 900 feet north of the southeast corner of sec. 33, T. 27 N., R. 47 E.

A1p—0 to 4 inches; dark grayish brown (2.5Y 4/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, sticky and plastic; many fine roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A12—4 to 6 inches; dark grayish brown (2.5Y 4/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium and coarse subangular blocky structure; slightly hard, friable, sticky and plastic; many fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—6 to 35 inches; grayish brown (2.5Y 5/2) stratified silty clay and silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, very sticky and very plastic; many fine roots; many very fine tubular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

C2—35 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; few fine roots; many very fine tubular pores; strongly effervescent; moderately alkaline.

The 10- to 40-inch control section is silty clay loam, clay, or silty clay. The profile is mildly alkaline or moderately alkaline. The A horizon is less than 5 percent finely divided lime. It is silty clay loam or silty clay.

Lonna Series

The Lonna series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on terraces and fans of uplands. Slope is 0 to 8 percent.

These soils are fine-silty, mixed Borollic Camborthids.

Typical pedon of Lonna silty clay loam, 0 to 4 percent slopes, in rangeland, 300 feet west and 1,800 feet north of the southeast corner of sec. 19, T. 17 N., R. 44 E.

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

B2—3 to 12 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, sticky and slightly plastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

B3ca—12 to 16 inches; very pale brown (10YR 7/4) silty clay loam, light yellowish brown (10YR 6/4) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common soft threadlike masses of lime; violently effervescent; moderately alkaline; clear smooth boundary.

C1ca—16 to 26 inches; very pale brown (10YR 7/4) silt loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, sticky and plastic; common fine roots; many fine tubular pores; common soft threadlike masses of lime; violently effervescent; moderately alkaline; clear smooth boundary.

C2—26 to 49 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; common fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

C3—49 to 60 inches; very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; few fine roots; many fine tubular pores; strongly effervescent; moderately alkaline.

The solum is 12 to 16 inches thick. The B3ca and C horizons are dominantly silt loam or silty clay loam, but in some pedons the C horizon has thin strata of very fine sandy loam.

Macar Series

The Macar series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on fans, terraces, foot slopes, and lower side slopes of hills on uplands. Slope is 0 to 20 percent.

These soils are fine-loamy, mixed, frigid Typic Ustochrepts.

Typical pedon of Macar loam, 0 to 4 percent slopes, in rangeland, 1,970 feet west and 2,365 feet north of the southeast corner of sec. 27, T. 20 N., R. 49 E.

A1—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; mildly alkaline; clear smooth boundary.

B2—3 to 10 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; slightly hard, very friable, nonsticky and

nonplastic; many fine roots; few fine tubular pores; slightly effervescent; mildly alkaline; clear wavy boundary.

B3ca—10 to 16 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; common fine tubular pores; 5 percent pebbles; common distinct lime coatings on lower surfaces of pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

C1ca—16 to 26 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; 5 percent pebbles; common distinct lime coatings on lower surfaces of pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

C2ca—26 to 34 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; common threadlike masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

C3ca—34 to 43 inches; light brownish gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; common fine tubular pores; 5 percent pebbles; few faint lime coatings on lower surfaces of pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C4—43 to 60 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; 5 percent pebbles; strongly effervescent; mildly alkaline.

The solum is 12 to 16 inches thick.

Marias Series

The Marias series consists of deep, well drained, very slowly permeable soils that formed in alluvium. These soils are on fans and terraces of uplands. Slope is 0 to 2 percent.

These soils are fine, montmorillonitic, frigid Udorthentic Chromusterts.

Typical pedon of Marias clay in rangeland, 970 feet west and 700 feet north of the southeast corner of sec. 18, T. 26 N., R. 43 E.

A11—0 to 3 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium subangular blocky structure parting to strong very fine and fine granular; slightly hard, friable, sticky and plastic; many fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

A12—3 to 12 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; slightly effervescent; moderately alkaline; clear wavy boundary.

C1—12 to 33 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse subangular blocky structure; hard, firm, very sticky and very plastic; many fine roots between peds; common distinct shiny slickensides; few threadlike masses of lime; slightly effervescent; moderately alkaline; clear wavy boundary.

C2cs—33 to 60 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse subangular blocky structure; hard, firm, very sticky and very plastic; few fine roots; few distinct shiny slickensides; common fine gypsum crystals; few threadlike masses of lime; slightly effervescent; moderately alkaline.

The profile is mildly alkaline or moderately alkaline. The 10- to 40-inch control section is clay or silty clay. In some pedons strata of silty clay loam or silt loam are in the lower part of the C horizon.

Marvan Series

The Marvan series consists of deep, well drained, salt- and sodium-affected, very slowly permeable soils that formed in alluvium. These soils are on fans and terraces and on foot slopes of low hills on uplands. Slope is 0 to 8 percent.

These soils are fine, montmorillonitic, frigid Udorthentic Chromusterts.

Typical pedon of Marvan clay, 0 to 8 percent slopes, 1,280 feet west and 2,400 feet south of the northeast corner of sec. 7, T. 26 N., R. 47 E.

Ap—0 to 4 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate very fine and fine granular structure; very hard, friable, very sticky and very plastic; many fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—4 to 27 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and very plastic; common fine roots; common fine tubular pores; few distinct shiny slickensides; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2cs—27 to 35 inches; olive (5Y 5/3) clay, olive (5Y 4/3) moist; massive; very hard, firm, very sticky and very plastic; few fine roots; common fine tubular pores; few faint shiny slickensides; common soft fine and medium gypsum crystals; strongly effervescent; strongly alkaline; clear smooth boundary.

IIC3—35 to 60 inches; light yellowish brown (2.5Y 6/4) silty clay loam stratified with thin bands of silt loam and fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent; strongly alkaline.

Cracks extend from the surface to a depth of 20 inches. The C horizon is clay, silty clay, or silty clay loam. It generally is moderately alkaline or strongly alkaline, but in some pedons it is very strongly alkaline in the lower part.

Neldore Series

The Neldore series consists of shallow, well drained, slowly permeable soils that formed in material derived from consolidated shale. These soils are on the sides and tops of hills and ridges on uplands. Slope is 2 to 45 percent.

These soils are clayey, montmorillonitic, nonacid, frigid, shallow Ustic Torriorthents.

Typical pedon of a Neldore clay in an area of Neldore-Badland-Bascovy complex, 15 to 45 percent slopes, in rangeland, 550 feet north and 1,600 feet east of the southwest corner of sec. 1, T. 26 N., R. 41 E.

A1—0 to 5 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; strong very fine and fine granular structure; hard, firm, sticky and plastic; many fine roots; neutral; clear wavy boundary.

C1—5 to 17 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, sticky and plastic; common fine roots; 70 percent soft shale fragments; slightly acid; gradual irregular boundary.

C2rcs—17 to 60 inches; olive gray (5Y 4/2) consolidated shale, dark olive gray (5Y 3/2) moist; common fine and medium gypsum crystals; slightly acid.

Consolidated shale is at a depth of 10 to 20 inches. The control section is clay or silty clay. The A horizon is 3 to 5 inches thick. In some pedons the C horizon is 70 percent soft shale fragments. It is medium acid to neutral. The Cr horizon is slightly acid to strongly acid.

Pendroy Series

The Pendroy series consists of deep, well drained, very slowly permeable soils that formed in clayey alluvium. These soils are in oxbows and depressional areas on terraces of the Missouri River. Slope is 0 to 2 percent.

These soils are very-fine, montmorillonitic, frigid Udorthentic Chromusterts.

Typical pedon of Pendroy clay in rangeland, 550 feet south and 10 feet east of the northwest corner of sec. 22, T. 26 N., R. 44 E.

A11—0 to 1 inch; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, friable, sticky and plastic; many fine roots; many fine vesicular pores, common fine tubular pores; neutral; abrupt smooth boundary.

A12—1 inch to 14 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; strong very fine and fine angular blocky structure; very hard, very firm, very sticky and very plastic; many fine roots; common fine tubular pores; slightly effervescent; mildly alkaline; clear wavy boundary.

C1cs—14 to 24 inches; grayish brown (2.5Y 5/2) clay, very dark grayish brown (2.5Y 3/2) moist; strong very fine and fine angular blocky structure; very hard, firm, very sticky and very plastic; many fine roots; common fine tubular pores; common threadlike gypsum crystals; slightly effervescent; mildly alkaline; clear wavy boundary.

C2csca—24 to 47 inches; grayish brown (2.5Y 5/2) clay, very dark grayish brown (2.5Y 3/2) moist; massive; hard, firm, very sticky and very plastic; common fine roots; common distinct shiny slickensides; common threadlike gypsum crystals; common threadlike masses of lime; slightly effervescent; moderately alkaline; clear wavy boundary.

C3csca—47 to 60 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky and plastic; few fine roots; common fine tubular pores; few shiny slickensides; common threadlike gypsum crystals; few firm threadlike masses of lime; strongly effervescent; moderately alkaline.

The 10- to 40-inch control section is 60 to 75 percent clay. Cracks extend from the surface to a depth of 15 to 25 inches. The profile is neutral or moderately alkaline.

Ridgelawn Series

The Ridgelawn series consists of deep, well drained soils that formed in alluvium. Permeability is moderate in the upper part of these soils and rapid in the lower part. These soils are on stream terraces and flood plains in valleys. Slope is 0 to 2 percent.

These soils are fine-loamy over sandy or sandy-skeletal, mixed (calcareous), frigid Typic Ustifluvents.

Typical pedon of Ridgelawn silt loam in rangeland, 2,640 feet south and 2,360 feet east of the northwest corner of sec. 35, T. 21 N., R. 49 E.

A1—0 to 7 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; weak medium angular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; many fine

tubular pores; slightly effervescent; moderately alkaline; clear wavy boundary.
C1—7 to 24 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, slightly sticky and nonplastic; many fine roots; many fine tubular pores; strongly effervescent; moderately alkaline; clear wavy boundary.
IIC2—24 to 60 inches; grayish brown (2.5Y 5/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few fine roots; slightly effervescent; moderately alkaline.

Depth to the sandy IIC horizon is 20 to 30 inches.

Rominell Series

The Rominell series consists of deep, well drained, slowly permeable, salt- and sodium-affected soils that formed in alluvium derived from sandstone and shale. These soils are on fans and terraces of uplands. Slope is 0 to 8 percent.

These soils are fine-loamy, mixed Borollic Natrargids.

Typical pedon of Rominell loam, 0 to 8 percent slopes, in rangeland, 1,650 feet east and 1,650 feet south of the northwest corner of sec. 19, T. 24 N., R. 48 E.

A1—0 to 4 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many fine roots; common fine tubular pores; mildly alkaline; clear smooth boundary.
A2—4 to 9 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; slightly effervescent; moderately alkaline; abrupt wavy boundary.
B2t—9 to 15 inches; light brownish gray (2.5Y 6/2) clay loam, olive brown (2.5Y 4/4) moist; strong medium columnar structure parting to strong medium angular blocky; very hard, firm, sticky and plastic; many fine roots; many fine tubular pores; common thin clay films on faces of peds; many distinct light gray (2.5Y 7/2) skeletans on tops and sides of columns; strongly effervescent; very strongly alkaline; clear wavy boundary.
B3cs—15 to 25 inches; light olive brown (2.5Y 5/4) loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; few light gray (2.5Y 7/2) skeletans on vertical faces of peds; few fine gypsum crystals; violently effervescent; very strongly alkaline; gradual wavy boundary.
C1cs—25 to 54 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; massive; hard, friable, sticky and slightly plastic; common fine roots; common fine tubular pores; few fine gypsum crystals; violently effervescent; strongly alkaline; gradual wavy boundary.
C2—54 to 60 inches; light olive brown (2.5Y 5/4) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, sticky and slightly plastic; few fine roots; common fine tubular pores; violently effervescent; very strongly alkaline.

The A1 horizon is neutral or moderately alkaline, and the A2 horizon is mildly alkaline to moderately alkaline. The B2t horizon is strongly alkaline or very strongly alkaline. The B3 and C horizons are mainly clay loam or loam and are strongly alkaline or very strongly alkaline.

Savage Series

The Savage series consists of deep, well drained, moderately slowly permeable soils that formed in alluvium. These soils are on terraces and fans of uplands. Slope is 0 to 4 percent.

These soils are fine, montmorillonitic Typic Argiborolls.

Typical pedon of Savage silty clay loam, 0 to 4 percent slopes, in cropland, 100 feet west and 300 feet south of the northeast corner of sec. 11, T. 22 N., R. 47 E.

Ap1—0 to 3 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to strong very fine granular; soft, very friable, sticky and plastic; many fine roots; neutral; abrupt smooth boundary.
Ap2—3 to 7 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark brown (10YR 2/2) moist; massive; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; neutral; abrupt smooth boundary.
B21t—7 to 16 inches; dark grayish brown (2.5Y 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, very sticky and plastic; many fine roots; many fine tubular pores; common thin clay films on faces of peds; neutral; clear wavy boundary.
B22t—16 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; slightly hard, friable, very sticky and plastic; many fine roots; many fine tubular pores; many thin clay films on faces of peds; strongly effervescent; moderately alkaline; gradual wavy boundary.
B3ca—28 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to

moderate fine and medium subangular blocky; hard, friable, very sticky and plastic; many fine roots; many fine tubular pores; common soft threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C1ca—36 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; hard, friable, very sticky and plastic; common fine roots; many fine tubular pores; common distinct light gray threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2cacs—43 to 55 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, very sticky and plastic; common fine roots; many fine tubular pores; common distinct light gray threadlike masses of lime; few threadlike masses of gypsum crystals; violently effervescent; moderately alkaline; gradual wavy boundary.

C3cacs—55 to 60 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; slightly hard, friable, sticky and plastic; few fine roots; common fine tubular pores; 5 percent pebbles; common soft threadlike masses of lime; few threadlike masses of gypsum crystals; violently effervescent; moderately alkaline.

The B2t horizon averages heavy silty clay loam or light silty clay. The B3ca and C horizons are silty clay loam, silty clay, or clay loam.

Shambo Series

The Shambo series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on fans, terraces, foot slopes, and side slopes on uplands. Slope is 0 to 15 percent.

These soils are fine-loamy, mixed Typic Haploborolls.

Typical pedon of a Shambo loam in an area of Shambo-Cambert loams, 2 to 8 percent slopes, in rangeland, 85 feet west and 94 feet north of the southeast corner of sec. 35, T. 19 N., R. 45 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine roots; many fine tubular pores; neutral; abrupt smooth boundary.

B21—4 to 7 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure; slightly hard, friable, slightly sticky and nonplastic; many fine roots; many fine tubular pores; neutral; clear wavy boundary.

B22—7 to 14 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; many fine roots; common fine tubular pores; mildly alkaline; clear wavy boundary.

B3ca—14 to 22 inches; pale yellow (2.5Y 7/4) loam, light yellowish brown (2.5Y 6/4) moist; moderate coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; many threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C1cs—22 to 60 inches; light gray (2.5Y 7/2) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many fine tubular pores; many fine and medium gypsum crystals; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 14 inches thick. The B horizon is neutral to moderately alkaline in the upper part and moderately alkaline to strongly alkaline in the lower part. The C horizon commonly is loam or clay loam, but in some pedons it has strata of sandy loam. It is mildly alkaline to strongly alkaline.

Sunburst Series

The Sunburst series consists of deep, well drained, slowly permeable soils that formed in glacial till. These soils are on knolls, foot slopes, side slopes, and ridges of hills on glaciated uplands. Slope is 2 to 45 percent.

These soils are fine, montmorillonitic (calcareous), frigid Ustic Torriorthents.

Typical pedon of Sunburst clay loam, 15 to 45 percent slopes, in rangeland, 2,205 feet north and 235 feet west of the southeast corner of sec. 36, T. 26 N., R. 42 E.

A1—0 to 3 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium subangular blocky structure parting to moderate fine granular; soft, very friable, sticky and plastic; many fine roots; 5 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1ca—3 to 19 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure; slightly hard, friable, sticky and very plastic; many fine roots; many fine tubular pores; 5 percent pebbles; common soft medium and coarse masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2ca—19 to 50 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium angular blocky structure; hard, firm, sticky and very plastic; few fine roots; common fine tubular pores; 5 percent pebbles; few soft threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C3cs—50 to 60 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; hard, firm, very sticky and very plastic; few fine roots; common fine tubular pores; 5 percent pebbles; few medium and coarse masses of gypsum crystals; strongly effervescent; moderately alkaline.

The C horizon commonly is clay or silty clay, but in some pedons it is silty clay loam.

Tally Series

The Tally series consists of deep, well drained, moderately rapidly permeable soils that formed in alluvial or eolian material. These soils are on fans and terraces and on foot slopes and side slopes of hills on uplands. Slope is 0 to 8 percent.

These soils are coarse-loamy, mixed Typic Haploborolls.

Typical pedon of Tally fine sandy loam, 0 to 4 percent slopes, in rangeland, 1,400 feet north and 20 feet west of the southeast corner of sec. 12, T. 16 N., R. 46 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and slightly plastic; many fine roots; neutral; abrupt smooth boundary.

B21—4 to 10 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate fine and medium angular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; neutral; clear wavy boundary.

B22—10 to 15 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure; slightly hard, friable, slightly sticky and nonplastic; many fine roots; many fine tubular pores; neutral; clear wavy boundary.

B3ca—15 to 20 inches; light brownish gray (10YR 6/2) sandy loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; few soft fine masses of lime; strongly effervescent; mildly alkaline; clear wavy boundary.

C1ca—20 to 31 inches; light gray (10YR 7/2) fine sandy loam, pale brown (10YR 6/3) moist; massive; hard, friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; many fine firm masses of lime; violently effervescent; mildly alkaline; clear wavy boundary.

C2ca—31 to 60 inches; light brownish gray (2.5Y 6/2) loamy fine sand, grayish brown (2.5Y 5/2) moist; single grain; loose; few fine roots; common lime coatings on sand; violently effervescent; moderately alkaline.

The mollic epipedon is 8 to 10 inches thick. The B2 and B3 horizons are fine sandy loam or sandy loam. The C horizon commonly is fine sandy loam or loamy fine sand, but in some pedons it has strata of loamy sand.

Telstad Series

The Telstad series consists of deep, well drained, slowly permeable soils that formed in glacial till. These soils are on glaciated uplands. Slope is 2 to 15 percent.

These soils are fine-loamy, mixed Aridic Argiborolls.

Typical pedon of a Telstad loam in an area of Telstad-Hillon loams, 2 to 8 percent slopes, in rangeland, 1,340 feet west and 1,810 feet north of the southeast corner of sec. 15, T. 25 N., R. 44 E.

A1—0 to 4 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; neutral; clear smooth boundary.

B21t—4 to 7 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; strong fine and medium prismatic structure parting to strong medium subangular blocky; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common thin dark brown (10YR 3/3) clay films on horizontal and vertical faces of peds; neutral; clear wavy boundary.

B22t—7 to 13 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common thin clay films on horizontal and vertical faces of peds; neutral; clear wavy boundary.

B3ca—13 to 22 inches; light gray (2.5Y 7/2) loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; many fine tubular pores; many medium and coarse masses of lime; violently effervescent; moderately alkaline; gradual smooth boundary.

C1ca—22 to 60 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, sticky and slightly plastic; few fine roots; few fine and medium masses of lime; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 15 inches thick. The A and B horizons are neutral or moderately alkaline. The B and C horizons are loam or clay loam.

Thoeny Series

The Thoeny series consists of deep, well drained, salt- and sodium-affected, very slowly permeable soils that formed in glacial till. These soils are in swales and on fans and foot slopes of low hills on glaciated uplands. Slope is 2 to 8 percent.

These soils are fine, montmorillonitic Borollic Natrargids.

Typical pedon of Thoeny loam, 2 to 8 percent slopes, in cropland, 1,400 feet north and 600 feet east of the southwest corner of sec. 12, T. 26 N., R. 49 E.

Ap1—0 to 6 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure parting to moderate very fine granular; slightly hard, very friable, sticky and slightly plastic; many fine roots; 5 percent pebbles; strongly effervescent; moderately alkaline; abrupt smooth boundary.

B21tca—6 to 12 inches; olive (5Y 5/3) clay loam, olive (5Y 4/3) moist; strong medium prismatic structure parting to strong medium subangular blocky; slightly hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common thin clay films on horizontal and vertical faces of peds; 5 percent pebbles; common distinct white lime coatings on lower surfaces of pebbles; violently effervescent; strongly alkaline; clear wavy boundary.

B22tca—12 to 22 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; strong fine prismatic structure parting to strong very fine angular blocky; hard, firm, very sticky and plastic; many fine roots; many fine tubular pores; many thin clay films on horizontal and vertical faces of peds; 5 percent pebbles; many distinct white lime coatings on lower surfaces of pebbles; violently effervescent; very strongly alkaline; clear wavy boundary.

B3tca—22 to 31 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, very sticky and plastic; common fine roots; many fine tubular pores; common thin clay films on horizontal and vertical faces of peds; 5 percent pebbles; many distinct lime coatings on lower surfaces of pebbles; violently effervescent; strongly alkaline; gradual wavy boundary.

C1cs—31 to 60 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, very sticky and plastic; few fine roots; common fine tubular pores; 5 percent pebbles; common fine and medium masses of gypsum crystals; strongly effervescent; strongly alkaline.

The control section is heavy clay loam or light clay. It is mildly alkaline or moderately alkaline.

These soils are taxadjuncts to the Thoeny series because they have a ca horizon within a depth of 10 inches and are very strongly alkaline in the B22tca horizon. These properties are outside the range of characteristics for the Thoeny series; they do not, however, significantly affect the use or behavior of these soils.

Trembles Series

The Trembles series consists of deep, well drained, moderately rapidly permeable soils that formed in alluvium. These soils are on stream terraces and flood plains. Slope is 0 to 2 percent.

These soils are coarse-loamy, mixed (calcareous), frigid Typic Ustifluvents.

Typical pedon of Trembles fine sandy loam in rangeland, 2,330 feet south and 787 feet east of the northwest corner of sec. 21, T. 19 N., R. 48 E.

A1—0 to 6 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

C1—6 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular pores; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2—16 to 60 inches; light brownish gray (2.5Y 6/2) fine sandy loam that has thin strata of loam and silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent; moderately alkaline.

The C horizon is stratified silty clay loam to loamy sand. It is dominantly sandy loam or fine sandy loam.

Turner Series

The Turner series consists of deep, well drained soils that formed in alluvium. Permeability is moderate in the upper part of these soils and rapid in the lower part. These soils are on fans, terraces, and foot slopes of low hills on uplands. Slope is 0 to 8 percent.

These soils are fine-loamy over sandy or sandy-skeletal, mixed Typic Argiborolls.

Typical pedon of Turner loam, 0 to 4 percent slopes, in cropland, 1,494 feet north and 1,340 feet east of the southwest corner of sec. 1, T. 23 N., R. 47 E.

Ap1—0 to 7 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse subangular blocky structure; slightly hard,

friable, slightly sticky and plastic; many fine roots; many fine tubular pores; 5 percent pebbles; mildly alkaline; abrupt smooth boundary.

B2t—7 to 14 inches; dark grayish brown (10YR 4/2) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; common thin very dark grayish brown (10YR 3/2) clay films on horizontal faces of peds; 5 percent pebbles; mildly alkaline; clear wavy boundary.

B31ca—14 to 20 inches; grayish brown (10YR 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, sticky and plastic; common fine roots; many fine tubular pores; few faint light gray calcium carbonate cutans throughout the soil; 5 percent pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

B32ca—20 to 28 inches; light brownish gray (2.5Y 6/2) loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common fine roots; many fine tubular pores; common distinct light gray (10YR 7/2) calcium carbonate cutans throughout; common distinct lime coatings on sand grains and pebbles; 5 percent pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

C1ca—28 to 33 inches; light brownish gray (2.5Y 6/2) gravelly loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; common fine tubular pores; many distinct lime coatings on sand grains and pebbles; 20 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

IIC2ca—33 to 60 inches; light olive brown (2.5Y 5/4) very gravelly loamy sand, olive brown (2.5Y 4/4) moist; single grain; loose; 60 percent pebbles; violently effervescent; moderately alkaline.

The mollic epipedon is 7 to 14 inches thick. Depth to the IIC horizon is 30 to 40 inches. The B2t horizon is neutral to moderately alkaline.

Twilight Series

The Twilight series consists of moderately deep, well drained, moderately rapidly permeable soils that formed in material derived from weakly consolidated, sandy sedimentary beds. These soils are on the sides and tops of hills on uplands. Slope is 2 to 25 percent.

These soils are coarse-loamy, mixed Borollic Camborthids.

Typical pedon of Twilight sandy loam in an area of Busby-Twilight-Fleak complex, 8 to 15 percent slopes, in rangeland, 2,400 feet north and 800 feet east of the southwest corner of sec. 34, T. 26 N., R. 44 E.

A1—0 to 5 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; neutral; clear wavy boundary.

B2—5 to 10 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; neutral; clear wavy boundary.

B3—10 to 16 inches; pale brown (10YR 6/3) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure; soft, very friable, nonsticky and nonplastic; many very fine roots; neutral; gradual wavy boundary.

C1ca—16 to 25 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; few threadlike masses of lime; slightly effervescent; neutral; gradual wavy boundary.

C2r—25 to 60 inches; light brownish gray (2.5Y 6/2) weakly consolidated sandy sedimentary beds that crush to loamy sand, dark grayish brown (2.5Y 4/2) moist; slightly hard, friable, nonsticky and nonplastic; few very fine roots in cracks and along bedding planes; neutral.

Depth to sedimentary beds is 20 to 40 inches.

Vanda Series

The Vanda series consists of deep, well drained, salt- and sodium-affected, very slowly permeable soils that formed in alluvium. These soils are on fans and terraces. Slope is 0 to 8 percent.

These soils are fine, montmorillonitic (calcareous), frigid Ustic Torriorthents.

Typical pedon of Vanda clay, 0 to 8 percent slopes, in rangeland, 2,600 feet east and 150 feet south of the northwest corner of sec. 9, T. 26 N., R. 47 E.

A1—0 to 2 inches; light gray (5Y 6/1) clay, dark gray (5Y 4/1) moist; strong fine and medium subangular blocky structure; very hard, firm, very sticky and very plastic; common fine roots; many fine vesicular pores; strongly alkaline; clear smooth boundary.

C1—2 to 11 inches; light olive gray (5Y 6/2) clay, olive gray (5Y 5/2) moist; strong very fine and fine angular blocky structure; very hard, very firm, very sticky and very plastic; common fine roots; common fine tubular pores; common soft medium masses of lime; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2cs—11 to 26 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; common fine roots; common medium and coarse masses of gypsum crystals; slightly effervescent; strongly alkaline; gradual wavy boundary.

C3—26 to 60 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate fine angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; common fine and medium masses of lime; slightly effervescent; strongly alkaline.

The A horizon is strongly alkaline or very strongly alkaline. The C horizon is clay or silty clay.

Vida Series

The Vida series consists of deep, well drained, moderately slowly permeable soils that formed in glacial till. These soils are on glaciated uplands. Slope is 0 to 15 percent.

These soils are fine-loamy, mixed Typic Argiborolls.

Typical pedon of Vida clay loam, 2 to 8 percent slopes, in rangeland, 2,220 feet east and 845 feet north of the southwest corner of sec. 25, T. 22 N., R. 49 E.

A1—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; neutral; clear smooth boundary.

B2t—2 to 9 inches; brown (10YR 4/3) clay loam, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, sticky and plastic; many fine roots; many fine tubular pores; many thin very dark grayish brown clay films on horizontal and vertical faces of peds; mildly alkaline; clear wavy boundary.

B3ca—9 to 19 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, sticky and slightly plastic; many fine roots; many fine tubular pores; 5 percent pebbles; common soft medium masses of lime; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1ca—19 to 60 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, sticky and plastic; few fine roots; common fine tubular pores; 5 percent pebbles; few soft fine masses of lime; violently effervescent; moderately alkaline.

The mollic epipedon is 7 to 10 inches thick. Depth to the ca horizon is 7 to 10 inches. The A and B2t horizons are neutral to moderately alkaline. The B3 and C horizons are clay loam or loam.

Wabek Series

The Wabek series consists of deep, excessively drained, very rapidly permeable soils that formed in alluvium. These soils are on fans, terraces, and terrace edges and on side slopes and tops of hills and ridges on uplands. Slope is 2 to 45 percent.

These soils are sandy-skeletal, mixed Entic Haploborolls.

Typical pedon of a Wabek sandy loam in an area of Cabba-Wabek-Dast complex, 15 to 45 percent slopes, in rangeland, 670 feet north and 1,450 feet east of the southwest corner of sec. 17, T. 17 N., R. 47 E.

A1—0 to 7 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; 10 percent coarse fragments; neutral; clear wavy boundary.

IIC1ca—7 to 12 inches; light gray (10YR 7/2) very gravelly sand, grayish brown (10YR 5/2) moist; single grain; loose; common fine roots; many distinct lime coatings on lower surfaces of coarse fragments; 45 percent coarse fragments; violently effervescent; slightly alkaline; clear wavy boundary.

IIC2—12 to 60 inches; light gray (10YR 7/2) very gravelly sand, grayish brown (10YR 5/2) moist; single grain; loose; few fine roots; few faint lime coatings on lower surfaces of coarse fragments; 50 percent coarse fragments; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 8 inches thick. Depth to very gravelly material is 7 to 15 inches. The C horizon is very gravelly loamy sand or very gravelly sand.

Weingart Series

The Weingart series consists of moderately deep, well drained, salt- and sodium-affected, very slowly permeable soils that formed in material derived from semiconsolidated shale. These soils are on foot slopes and lower side slopes of uplands. Slope is 2 to 8 percent.

These soils are fine, montmorillonitic Borollic Natrargids.

Typical pedon of Weingart clay, 2 to 8 percent slopes, in rangeland, 1,260 feet east and 780 feet south of the northwest corner of sec. 11, T. 26 N., R. 48 E.

A1—0 to 1 inch; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive;

slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine vesicular pores; 10 percent pebbles on the surface; mildly alkaline; abrupt smooth boundary.

B2t—1 inch to 9 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; strong fine and medium prismatic structure; very hard, firm, sticky and plastic; many fine roots; common fine tubular pores; common thin clay films on vertical faces of peds; few threadlike masses of lime; slightly effervescent; very strongly alkaline; clear wavy boundary.

B3cs—9 to 21 inches; olive gray (5Y 5/2) silty clay, olive gray (5Y 4/2) moist; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; very hard, friable, sticky and plastic; many fine roots; many fine and medium masses of gypsum crystals; few threadlike masses of lime; slightly effervescent; moderately alkaline; clear wavy boundary.

C1cs—21 to 30 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; massive; hard, friable, sticky and plastic; many fine roots in cracks; common distinct brownish yellow cutans; common fine masses of gypsum crystals; 75 percent soft shale fragments; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2r—30 to 60 inches; light olive gray (5Y 6/2) semiconsolidated very thinly bedded shale that crushes to silty clay, olive (5Y 4/3) moist; hard, firm, sticky and plastic; moderately alkaline.

Depth to semiconsolidated shale is 20 to 40 inches. The control section is silty clay or clay.

Williams Series

The Williams series consists of deep, well drained, moderately slowly permeable soils that formed in glacial till. These soils are on glaciated uplands. Slope is 0 to 4 percent.

These soils are fine-loamy, mixed Typic Argiborolls.

Typical pedon of a Williams loam in an area of Williams-Vida complex, 2 to 4 percent slopes, in cropland, 2,400 feet west and 50 feet south of the northeast corner of sec. 28, T. 23 N., R. 49 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; 5 percent pebbles; mildly alkaline; abrupt smooth boundary.

B2t—8 to 15 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium prismatic structure; slightly hard, very friable, sticky and plastic; many fine roots; few thin clay films on vertical faces of peds; 5 percent pebbles; moderately alkaline; clear wavy boundary.

B3ca—15 to 23 inches; brown (10YR 5/3) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure; slightly hard, friable, sticky and plastic; many fine roots; many distinct lime coatings on horizontal and vertical faces of peds and common distinct lime coatings on gravel; 5 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1ca—23 to 37 inches; light gray (5Y 7/2) clay loam, olive (5Y 5/3) moist; massive; hard, friable, sticky and plastic; common fine roots; common distinct lime coatings on gravel; 5 percent pebbles; common threadlike masses of lime; violently effervescent; moderately alkaline; clear wavy boundary.

C2ca—37 to 60 inches; light olive gray (5Y 6/2) clay loam, olive (5Y 4/3) moist; massive; hard, firm, sticky and plastic; few fine roots; 5 percent pebbles; common threadlike masses of lime; strongly effervescent; moderately alkaline.

The mollic epipedon is 8 to 15 inches thick. Depth to carbonates is more than 10 inches. The B3ca and C horizons are clay loam or loam.

Yamac Series

The Yamac series consists of deep, well drained, moderately permeable soils that formed in alluvium. These soils are on uplands. Slope is 0 to 25 percent.

These soils are fine-loamy, mixed Borollic Camborthids.

Typical pedon of Yamac loam, 8 to 15 percent slopes, in rangeland, 670 feet east and 80 feet north of the southwest corner of sec. 28, T. 26 N., R. 43 E.

A1—0 to 4 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; clear wavy boundary.

B2—4 to 11 inches; olive (5Y 5/3) loam, olive (5Y 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; slightly hard, friable, slightly sticky and plastic; many fine roots; many fine tubular pores; slightly effervescent; mildly alkaline; gradual wavy boundary.

B3ca—11 to 19 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure; slightly hard, friable, slightly sticky and plastic; many fine roots; many fine tubular pores; common soft threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C1ca—19 to 34 inches; pale olive (5Y 6/3) loam, olive (5Y 4/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic;

common fine roots; many fine tubular pores; few distinct white lime coatings on faces of peds; common soft threadlike masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2ca—34 to 48 inches; pale olive (5Y 6/4) loam, olive (5Y 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; common threadlike masses of lime; violently effervescent; strongly alkaline; gradual wavy boundary.

C3—48 to 60 inches; pale olive (5Y 6/4) light loam, olive (5Y 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; common fine tubular pores; strongly effervescent; strongly alkaline.

The solum is 13 to 19 inches thick. The 10- to 40-inch control section is loam or clay loam. The A horizon is mildly alkaline or moderately alkaline.

Yawdim Series

The Yawdim series consists of shallow, well drained, slowly permeable soils that formed in material derived from semiconsolidated shale. These soils are on uplands. Slope is 2 to 45 percent.

These soils are clayey, montmorillonitic (calcareous), frigid, shallow Ustic Torriorthents.

Typical pedon of Yawdim silty clay, 2 to 8 percent slopes, in rangeland, 1,812 feet east and 2,443 feet north of the southwest corner of sec. 3, T. 26 N., R. 48 E.

A1—0 to 6 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate fine angular blocky structure; slightly hard, very friable, sticky and plastic; many fine roots; strongly effervescent; moderately alkaline; clear wavy boundary.

C1ca—6 to 15 inches; light olive gray (5Y 6/2) silty clay, olive gray (5Y 5/2) moist; massive; hard, friable, sticky and plastic; many fine roots; common distinct brownish yellow cutans; common threadlike masses of lime; 80 percent soft shale fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

C2rcsca—15 to 22 inches; light olive gray (5Y 6/2) semiconsolidated shale that crushes to silty clay, olive gray (5Y 4/2) moist; hard, firm, sticky and plastic; common fine roots in cracks and along bedding planes; common fine masses of gypsum crystals; common threadlike masses of lime; slightly effervescent; moderately alkaline; clear wavy boundary.

C3rcs—22 to 60 inches; light olive gray (5Y 6/2) semiconsolidated shale that crushes to silty clay, olive (5Y 4/3) moist; hard, firm, sticky and plastic; few fine roots in cracks and along bedding planes; common fine masses of gypsum crystals; moderately alkaline.

Semiconsolidated shale is at a depth of 10 to 20 inches.

Yetull Series

The Yetull series consists of deep, somewhat excessively drained, rapidly permeable soils that formed in sandy alluvial and eolian material. These soils are on fans, foot slopes, and side slopes of hills and ridges on uplands. Slope is 2 to 15 percent.

These soils are mixed, frigid Ustic Torripsamments.

Typical pedon of a Yetull fine sandy loam in an area of Twilight-Yetull fine sandy loams, 8 to 15 percent slopes, in rangeland, 2,036 feet east and 2,000 feet north of the southwest corner of sec. 3, T. 19 N., R. 45 E.

A1—0 to 6 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly effervescent; mildly alkaline; clear wavy boundary.

C1—6 to 9 inches; light brownish gray (10YR 6/2) loamy sand, grayish brown (10YR 5/2) moist; single grain; loose; many fine roots; strongly effervescent; mildly alkaline; gradual wavy boundary.

C2—9 to 60 inches; light brownish gray (10YR 6/2) loamy sand, grayish brown (10YR 5/2) moist; single grain; loose; few fine roots; slightly effervescent; mildly alkaline.

The C horizon is loamy sand or sand.

Zahill Series

The Zahill series consists of deep, well drained, moderately slowly permeable soils that formed in glacial till. These soils are on glaciated uplands. Slope is 2 to 45 percent.

These soils are fine-loamy, mixed (calcareous), frigid Typic Ustorthents.

Typical pedon of Zahill loam, 2 to 8 percent slopes, in cropland, 300 feet south and 1,870 feet east of the northwest corner of sec. 31, T. 23 N., R. 49 E.

Ap—0 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.

C1ca—6 to 22 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; 5 percent pebbles; common faint lime

coatings on lower surfaces of pebbles; many fine masses of lime; violently effervescent; moderately alkaline; gradual wavy boundary.

C2ca—22 to 60 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; 5 percent pebbles; many distinct lime coatings on lower surfaces of pebbles; many fine and medium masses of lime; violently effervescent; moderately alkaline.

The C horizon is loam or clay loam.

Geology

By Eddie Juvan, geologist, Soil Conservation Service.

McCone County is bounded on the north by the Missouri River. With the exception of a small area in the southeastern part of T. 17 N., R. 49 E., the county lies entirely within the drainage basins of Redwater River, Big Dry Creek, and several shorter tributaries of the Missouri River, including Prairie Elk and Sand Creeks.

Elevation generally decreases from the southern boundary of the county to the Missouri River. The Sheep Mountain divide, between the Yellowstone and Missouri Rivers, crosses the extreme southeastern part of the county. The altitude of this divide is 3,300 feet. The elevation along the Missouri River at the McCone-Richland County line is 1,960 feet. Total relief in McCone County is 1,340 feet. The Horse Creek Divide separates Big Dry Creek and Redwater River. Redwater River drains the eastern half of the county, and Big Dry Creek drains the western half.

Barren, steep areas of badland are common in parts of the county. The Dry Creek Badland, near the western boundary, extends several miles east of Big Dry Creek and the eastern arm of the Fort Peck Reservoir. Small tracts of Badland are on the breaks of the Missouri and Redwater Rivers and along Hungry, Prairie Elk, and Sand Creeks. The higher parts of the northwestern slope of the Sheep Mountain Divide are also rugged.

Most of the county is characterized by rolling hills and long, gentle slopes. The upland areas have varied features such as glacial plains, isolated buttes, small mesas and benches, gravel deposits, and masses of rock fused or baked by the burning of adjacent coalbeds. The major valleys are wide and open and are characterized by broad alluvial flats in which meandering stream channels are entrenched to a depth of 30 feet. The alluvial valleys commonly are bordered by low bluffs 20 to 70 feet high. The bottom land of the Missouri River includes a wide flood plain and remnants of low terraces.

The present land surfaces in the county reflect long periods of sedimentation and erosion. Many stratigraphic units are exposed at the surface. As the level of the seas that covered much of Montana hundreds of millions of years ago fluctuated, alternating deposits of sand, mud, and lime were laid down. These deposits over a period of time became compacted, cemented, and hardened as they changed from mud and sand into shale and sandstone.

The deposits of sediment were nearly horizontal when they were deposited, and they remained so until late Eocene, about 30 million years ago. They have since been tilted, folded, and faulted. This deformation occurred after the deposition of the highest beds of the Tongue River and before the development of the Flaxville Plain. Except in a narrow zone along a monoclinal fold extending southwestward from Weldon and along the Poplar anticline in the northeastern corner of the county, the strata of bedrock appear to be horizontal. However, the county lies in a broad syncline. The syncline, whose axis crosses the southern townships of the county, is about 250 miles long. It extends westward to Fergus County and eastward to Fallon County. The western extension of the syncline is known as the Blood Creek syncline, and the eastern extension is known as the sheep Mountain syncline. Dips toward the axis of the syncline generally are less than 1 degree. Dips along the Weldon monocline are 1 to 3 degrees. The dip of the monocline is plainly visible near the old stage road in the northwestern part of T. 21 N., R. 46 E. and in T. 20 N., R. 44 E. Faulting can also be seen in the area just east of Weldon.

Rocks along Redwater River in the northeastern townships are part of the Poplar anticline. The bedrock in this area has a southwesterly dip of 2 to 3 degrees.

After deformation of the rock in northeastern Montana and adjacent parts of Canada, four erosional surfaces developed. The highest surface, and therefore the oldest, is the Cypress Plain. The gravel on this surface contains remains of Oligocene land animals. Below the Cypress Plain is the Flaxville Plain, which has yielded Miocene or early Pliocene mammalian remains. A third surface, which is younger than the Flaxville Plain, developed during late Pliocene and early Pleistocene. The fourth stage of erosion in northeastern Montana began in early Pleistocene and resulted in the development of the lowest terrace along the Missouri River. The Missouri River then incised the valley 100 feet deep or more. This process was interrupted by the movement of a great glacial ice sheet into the northern part of McCone County (*4*).

All rock exposed in McCone County is of sedimentary origin, and it ranges in age from Upper Cretaceous to Recent (*6*). The Marine Bearpaw Shale (Upper Cretaceous) is the oldest formation that outcrops in the county. It is overlain by the Fox Hills Sandstone (Upper

Cretaceous) that is chiefly marine and is overlain by about 900 feet of nonmarine shale and sandstone of the Lance Formation. The youngest bedrock formation exposed in the county is the Fort Union beds, which are more than 700 feet thick. The Fort Union beds consist of layers of dark shale with alternate thick layers of white sandy clay and sandstone and coalbeds. Deposits ranging in age from Oligocene to Recent form a thin mantle over the eroded bedrock surfaces. These deposits include loess, morainal material, terrace gravel, and alluvial fill along the streams.

The Bearpaw Shale is exposed south of the Missouri River, near the northwestern corner of the county. It extends eastward along the river and several miles up Big Dry and Prairie Elk Creeks. The part of the Bearpaw Shale that appears at the surface is 420 feet thick. Because of its synclinal structure, the Bearpaw Shale disappears below the flood plain of the Missouri River, near Wolf Point, and reappears as a narrow strip near the eastern boundary of the county. The Bearpaw Shale is dark gray marine material that is sandy in the upper part. Representative soils that formed in material derived from Bearpaw Shale are those of the Gerdrum, Neldore, Marias, Bascovy, Marvan, and Vanda series. The Bearpaw Shale is not considered to be a ground water aquifer in this county. Any water available in the Bearpaw Shale is unsuitable for most uses.

Toward the end of the Cretaceous, forces in the earth caused the uplift of the ancestral Rocky Mountains. Before the second phase of mountain-building, during the Middle Tertiary, these ancestral mountains were subjected to erosion that persisted until the surface was again a flat, truncated plain. Products of erosion during this period were spread for hundreds of miles over a plain east of the mountains. The Lance Formation of late Cretaceous and the Fort Union Formation of early Tertiary resulted.

The transition between the Bearpaw Shale and the Fox Hills Sandstone of the Lance Formation is gradual. The Fox Hills Sandstone crops out along the Missouri River and in Big Dry and Prairie Elk Creeks. It is composed of two parts. The basal part, which is of marine origin, is 80 to 100 feet thick and is composed chiefly of thin beds of grayish yellow sandy shale. The upper part, about 80 feet thick, is made up of massive beds that generally are cross-bedded and consist of soft, light brown sandstone containing irregularly shaped concretions of harder sandstone as much as 3 feet in diameter. Thin coalbeds are also in some places. The nonmarine origin of the upper part is indicated by the numerous remains of dinosaurs and other nonmarine vertebrates and plants in it. Soils such as those of the Fleak, Twilight, Yamac, and Yawdim series developed in material derived from this formation. The Fox Hills Sandstone is considered to be an excellent ground water aquifer. The water is soft, and wells yield as much as 90 gallons per minute.

The Hell Creek Member of the Lance Formation consists of somber-colored shale; thin interbedded sandstone, siltstone, and thin seams of coal. This bedrock is more than 400 feet thick and overlies the Fox Hills Sandstone. It outcrops along Big Dry Creek and in a broad strip of land extending eastward across the northern part of the county. Soils such as those of the Chinook, Cambeth, Absher, Gerdrum, Twilight, and Yawdim series developed in material derived from this rock. Interbedded with the sediment of the Hell Creek Member are beds of coal, which indicate the presence of swamps on the coastal plains. The skeletons of large dinosaurs, including Triceratops, commonly are discovered in buried rock of the Hell Creek Member. Beds of bentonite as much as 2 or 3 feet thick are in many areas. Volcanic ash was deposited in the marine seas, and it was chemically altered to bentonite. The sandstone and coalbeds in the Hell Creek Member are good aquifers, and wells can yield a small amount of water for domestic use and for livestock.

The Tullock Member is the upper part of the Lance Formation. It is composed of dark carbonaceous shale and coalbeds separated by light-colored sandstone, shale, and sandy shale. It is about 200 feet thick. Steep, barren side slopes and cliffs are characteristic of this member. Outcroppings of the Tullock Member form an irregular belt trending northeastward from T. 20 N., R. 43 E. to the vicinity of Sheep Creek in T. 26 N., R. 49 E., in the northeastern part of the county. Because of its synclinal structure, the belt bends and trends in a southeastward direction to Wolf Creek. Along Sand Creek, in T. 24 N., R. 47 E. and in the eastern part of the area north of T. 24 N., the Tullock Member is dominantly yellow. It has a more somber color in the western part of the county, where it can be distinguished from rock above and below by its greater resistance to weathering. Among the soils that formed in material derived from the Tullock Member are those of the Cambert, Cambeth, Barkof, Fleak, and Yawdim series.

The Fort Union Formation of Eocene age is about 1,100 feet thick in the county. It overlies the Lance Formation. It is composed of a lower part, the Lebo Shale Member, and an upper part, the Tongue River Member.

The Lebo Shale Member consists of thick beds of white sandy clay and brownish clayey sandstone alternating with layers of nearly black clay shale. The color and predominance of clay distinguishes the Lebo Member from the sandy, yellow Tongue River Member that overlies it. Outcroppings of the Lebo Shale Member form a broad belt, extending in a northeasterly direction across the county from T. 19 N., R. 43 E. through Weldon to the region northeast of Vida. The most striking exposures are at the head of Prairie Elk Creek, near Weldon. Lebo Shale beds about 200 feet thick are exposed in the barren walls of the valley, which was

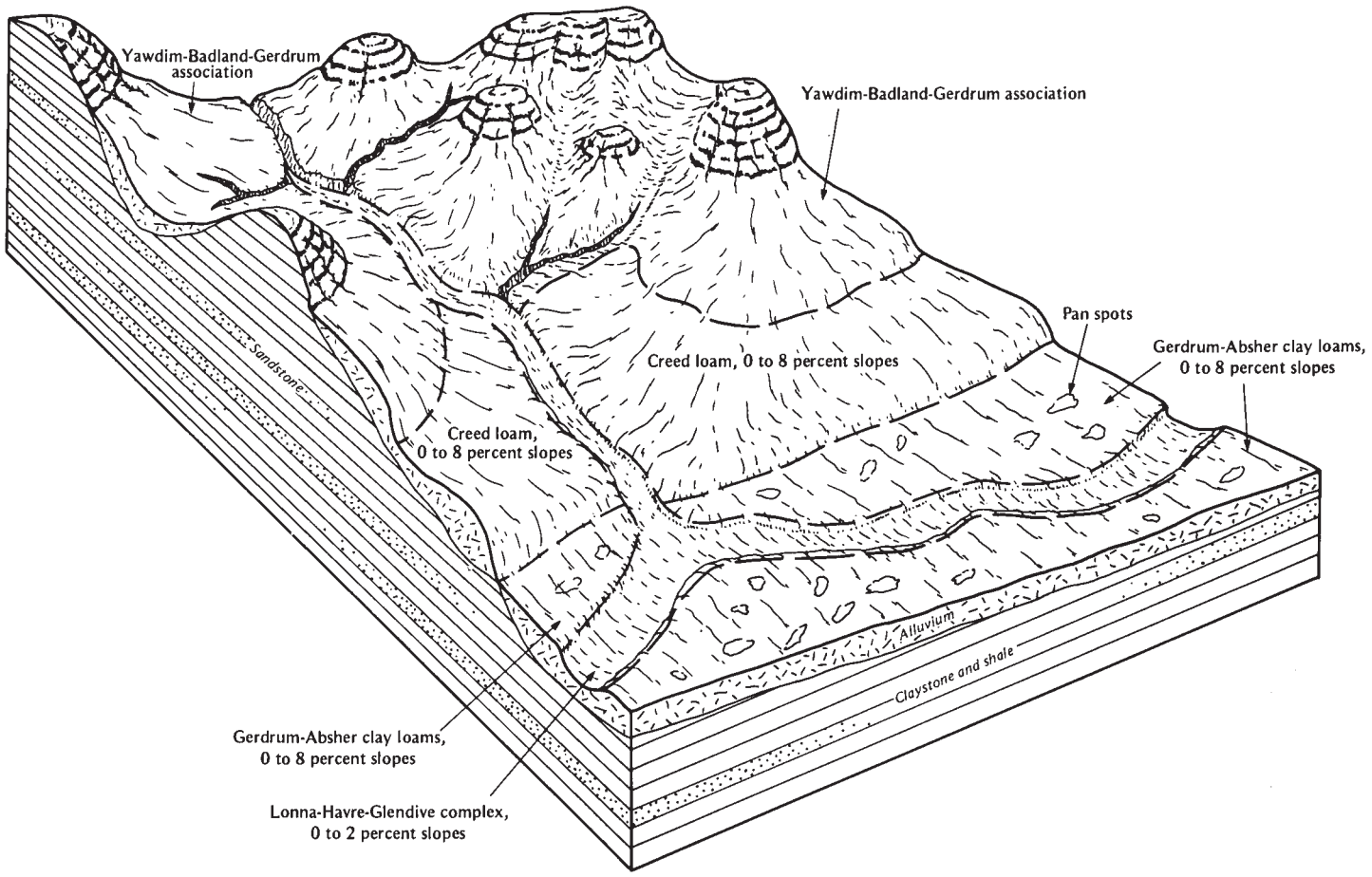

Figure 1.—Typical area of the county showing relationship of the detailed soil map units, topography, and geology in the Lebo Shale Member of the Fort Union Formation.

truncated during Pleistocene by waters flowing along the front of the Keewatin ice sheet. Except for the Big Dirty coalbed at its base, the Lebo Shale contains only a few lenses of coal. The most distinguishing characteristics of the Lebo Shale are its somber, dark color, the barren surface, and the ironstone concretions in some places. The Lebo Shale weathers to badland with occasional low, flat-topped buttes banded in shades of light to dark drab. Gerdrum, Absher, Cabbart, Fleak, Weingart, and Yawdim soils are among those that developed in material derived from this member (fig. 1).

The contact between the Lebo and Tongue River Members of the Fort Union Formation is approximately 50 feet below the most valuable coalbed in the county. The beds of the Tongue River Member are yellowish to light gray sandstone, sandy shale, coal, and scoria. About 700 feet of these beds is exposed in the county. The lower 400 feet contains at least four extensive coalbeds and several small lenses of coal. About 200 feet of the upper Tongue River Member is exposed in T. 17 N., R. 49 E., along the road from Brockway to Glendive. These beds are more uniformly light in color and are composed principally of siltstone and silty shale.

The most distinguishing characteristic of the Tongue River Member is the bright red scoria, or clinker, beds. This unusual type of rock has developed locally where thick seams of coal have burned. The burning caused baking and reddening of the overlying material. In some places the heat from burning coal was so intense that it fused shale into liquid slag. The clinker beds are along outcroppings of thick seams of coal. The red clinker deposits seldom extend far underground; however, in upland areas where the overburden was not thick, these deposits are as much as 100 feet thick. Because of the resistance of clinker beds to erosion, they commonly stand out in sharp relief and tend to develop semirugged topography. Soils that contain ash from the burned coalbeds are alkaline.

The sandstone of the Tongue River Member is massive and blocky. The outcroppings are light gray to

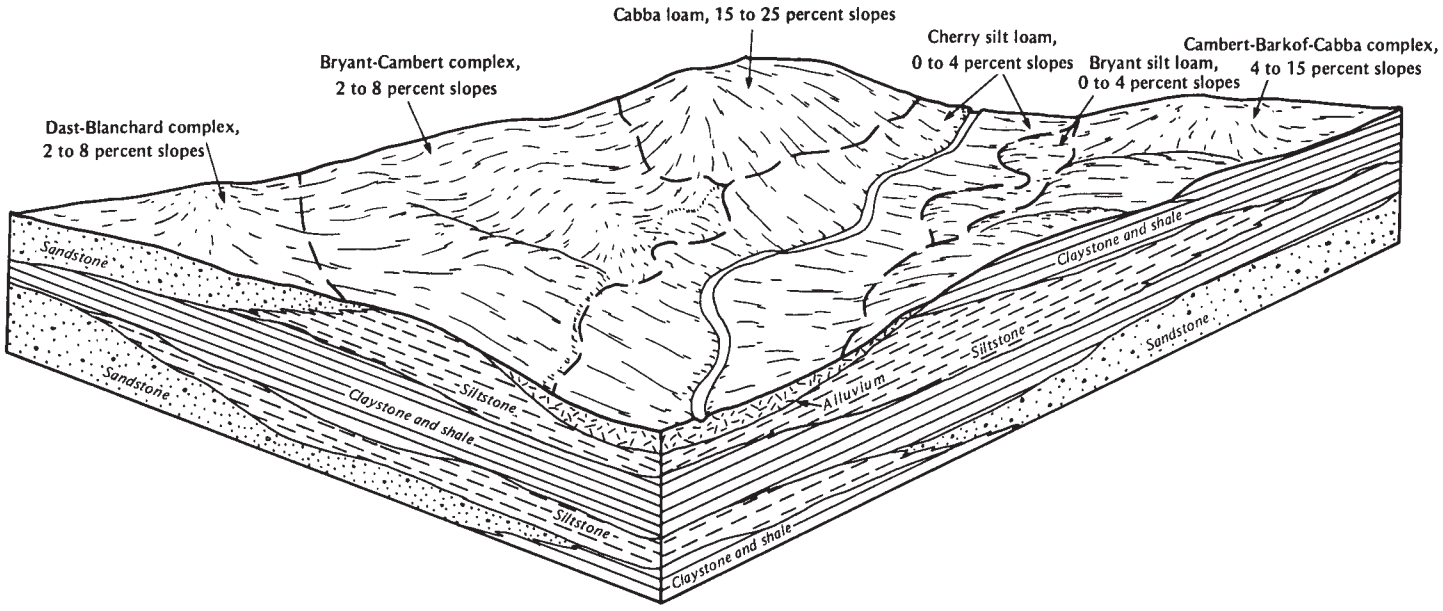

Figure 2.—Typical area of the county showing the relationship of the detailed soil map units, topography, and geology in the Tongue River Member of the Fort Union Formation.

light tan. This sandstone forms striking outcroppings and may occur as cavernous-faced cliffs that are 50 to 75 feet high and have many large knobs and sharp pinnacles. The sandstone is composed primarily of subangular quartz, but many grains of silicate minerals such as mica and feldspar are present. Some areas of the sandstone contain flakes of gypsum. The cementing material is calcium carbonate and clay. Concretions, many of which are pyrite and marcosite, are common in the sandstone. These concretions weather to brown limonite.

The sandstone of the Tongue River Member is a good ground water aquifer. Yields of 6 to 15 gallons per minute can be expected from wells. Soils that developed from the lower, coal-bearing part of the Tongue River Member include those of the Busby, Brandenberg, Cabba, Dast, Cambert, Bryant, and Barkof series. Soils that developed from the upper, silty part include those of the Bryant, Cabba, Cabbart, and Dast series (fig. 2).

Gravel deposits correlated with the Cypress Hills geomorphic surface occur on the divide crossing T. 17 N., R. 49 E. These deposits have a maximum thickness of 100 feet. The gravel deposits on Sheep Mountain, to the southwest along the divide in T. 15 N., R. 47 E., and the Little Sheep Mountain, 12 miles south of Antelope Mountain in townships 17 and 18 N., R. 50 E., all are at the same altitude as the gravel in T. 17 N., R. 49 E. Sheep Mountain and Antelope Mountain are also capped by gravel. No fossils have been found in these gravel deposits, and their correlation with the Oligocene gravel on the Cypress Hills, Saskatchewan, is based on their high topographic position. Soils of the Lehr, Wabek, and Turner series formed in these deposits.

The Flaxville Plain is primarily located north of the Missouri River; however, small remnants are south of the river. The Miocene or Pliocene terrace gravel in T. 17 N., R. 49 E. is thought to be an extension of the Flaxville Plain. This gravel is also present southeast of Redwater River and on the Horse Creek Divide. The gravel deposit in section 36, T. 25 N., R. 43 E., elevation 2,781 feet, is quartzite. The Turner soils formed in these gravel deposits.

Soils on late Pliocene and early Pleiostocene terraces are above the flood plain of the Missouri River. These terraces are 200 to 300 feet high. The flood plain is covered with waterworn, nonglacial gravel that generally is overlain by glacier drift. It is at an elevation of 2,393 to 2,515 feet. Typical Pleiostocene deposits are present in sections 6 and 29, T. 25 N., R. 47 E; section 4, T. 24 N., R. 47 E; section 32, T. 25 N., R. 42 E; and section 7, T. 24 N., R. 44 E. Among the soils that developed in these deposits are those of the Banks and Lehr series.

During the Pleistocene Epoch of the Quaternary, which began about 1 million years ago, the climate of North America became cold enough for thousands of feet of glacial ice to accumulate over most of Canada (*4*). Because of the mobility and weight of the ice, it spread southward into the northern United States. As it moved forward, it gathered soil material and loose rock. Upon melting, this material was left blanketing the land surface. These glacial deposits consist of unstratified clay, silt, and sand mixed with boulders and cobbles of

limestone, granite, and other crystalline rock. The rock is from outcroppings as distant as the Hudson Bay area and includes sandstone from local rock exposures of Cretaceous and Tertiary age. The glacial deposits extend across the county from T. 21 N., R. 40 E. on the west to T. 22 N., R. 50 E. along the eastern boundary. They are as much as 30 feet thick. Boulders can be found on the surface a few miles south of the main areas affected by glaciation. These boulders were deposited by icebergs floating beyond the advance of the glaciers. Soils that formed in glacial deposits include those of the Williams, Bowbells, Zahill, Thoeny, and Vida series.

In parts of the county, the surface is mantled by fine gravel and windblown material. These deposits consist of very fine sand and silt and generally are not stratified. Where dissected by drainageways, they are characterized by steep banks. These deposits were laid down at relatively low density and are subject to consolidation. If the soils that formed in these deposits are irrigated, settlement may become a major problem. Blanchard, Chinook, Lisk, Tally, Busby, and Yetull soils are among those that formed in these wind blown deposits.

Stratified clay, silt, sand, and gravel underlie the Missouri River flood plain. These deposits are as much as 50 feet thick. Deposits ranging from 5 to 35 feet in thickness are along the flood plain of the tributaries of the river. Locally, these deposits are an important source of ground water at a shallow depth. Many wells produce water for domestic use and livestock from this aquifer. Among the soils that formed in these recent alluvial deposits are those of the Havre, Havrelon, Lonna, Macar, Glendive, and Cherry series.

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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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

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

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

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

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3.75
Low	3.75 to 5.0
Moderate	5.0 to 7.5
High	More than 7.5

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

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

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

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

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

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

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

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

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

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles.

Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

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

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

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 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 (7.5 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Codominant trees. Trees that have crowns forming the general level of the forest canopy and that receive full light from above but little from the sides.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). 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.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

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.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Dominant trees. Trees that have crowns forming the general level of the forest canopy and that receive full light from above and from the sides.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

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.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 37.5 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest land. Land at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for nonforest use.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter. Very gravelly soil material is 35 to 60 percent rounded or angular rock fragments, and extremely gravelly soil material is more than 60 percent.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major

horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

A2 horizon. —A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a 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. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 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.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 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.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Overstory. The trees in a forest stand that form the upper crown.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that

water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range. Range includes rangeland, native pasture, and many forest lands that support an understory or periodic cover of vegetation suitable for grazing.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regeneration. The new growth of a natural plant community that develops from seed or sprouts.

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 is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Riparian. An area of land adjacent to a body of water and directly affected by the water. An area and a biotic community influenced by a high water table and commonly adjacent to surface water. Riparian ecosystems are diversified, widespread, and vary in size and vegetative complexity. Riparian zones have the following in common; (1) they create well defined habitat zones within much drier surroundings; (2) they make up a minor proportion of the overall area; (3) they generally are more productive per acre than the rest of the area; and (4) they are sources of diversity. Riparian zones have commonly been recognized as riparian woodland or streambank vegetation in the west.

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.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Scribner's log rule. A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

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.

Selection silvicultural system. A method of harvesting trees that involves the removal of mature and immature trees, either singly or in groups, at intervals. Regeneration is established almost continuously and an uneven-aged stand is maintained.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shelterwood silvicultural system. A method of harvesting trees that involves removing the stand in a series of cuts. Regeneration occurs under a partial forest canopy. After regeneration is established, a final harvest cut removes the shelterwood and permits the stand to develop in the open as an even-aged stand.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Skid trail. The pathway along which logs are moved from the woods to a common site for loading onto a logging truck.

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.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity are—

	SAR
Slight	Less than 13:1
Moderate	13-30:1
Strong	More than 30:1

Soft bedrock. Bedrock that can be excavated using a single-toothed ripping attachment mounted on a tractor with a 200 to 300 drawbar horsepower rating. (See rippable.)

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 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

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.

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 and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

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 is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

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.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Woodland suitability group. A grouping of soils that are capable of producting similar kinds and amounts of wood crops and that require similar management to produce those crops.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1959-78 at Brockway, Mont.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.1 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	23.6	-0.7	11.5	53	-39	17	0.29	0.06	0.46	1	5.0
February	32.3	9.0	20.7	58	-26	19	0.19	---	0.32	1	1.0
March	41.9	16.8	29.4	76	-22	88	0.36	0.11	0.55	1	3.0
April	56.1	28.9	42.5	83	4	161	1.11	0.32	1.74	4	0.5
May	67.9	39.0	53.5	93	22	419	2.24	0.91	3.30	5	0.0
June	77.7	48.2	63.0	97	31	690	2.76	1.05	4.14	5	0.0
July	86.2	52.3	69.3	104	37	908	1.70	0.68	2.52	4	0.0
August	85.4	50.2	67.8	102	33	862	1.30	0.34	2.05	3	0.0
September	72.9	39.8	56.5	97	20	506	1.40	0.37	2.22	3	0.0
October	60.5	29.7	45.2	86	7	207	0.60	0.07	0.99	2	0.0
November	42.1	17.0	29.6	71	-17	20	0.29	0.03	0.48	1	1.8
December	29.9	6.8	18.4	57	-36	18	0.27	0.03	0.45	1	1.0
Yearly:											
Average	56.4	28.1	42.3	---	---	---	---	---	---	---	---
Extreme	---	---	---	104	-39	---	---	---	---	---	---
Total	---	---	---	---	---	3,915	12.51	9.47	15.35	31	12.3

See footnote at end of table.

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued

[Recorded in the period 1963-78 at Circle, Mont.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.1 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	22.8	0.1	11.5	49	-37	22	0.60	0.14	0.96	2	10.5
February---	31.6	8.8	20.2	56	-25	23	0.27	0.03	0.45	1	4.8
March------	40.7	16.9	28.8	73	-21	65	0.56	0.26	0.80	2	5.7
April------	55.6	30.6	43.1	81	4	169	1.45	0.44	2.25	4	3.4
May--------	68.2	40.7	54.5	93	23	450	2.33	0.92	3.47	6	0.3
June-------	77.7	50.3	64.0	98	35	720	3.14	1.60	4.40	6	0.0
July-------	86.1	54.8	70.5	103	38	946	1.90	1.11	2.59	4	0.0
August-----	84.5	52.5	68.5	102	35	884	1.40	0.38	2.20	3	0.0
September--	72.4	42.0	57.3	97	24	528	1.31	0.38	2.05	3	0.0
October----	60.4	31.2	45.8	85	11	235	0.70	0.07	1.17	2	0.9
November---	41.1	17.6	29.4	69	-13	20	0.46	0.12	0.71	2	4.1
December---	28.1	6.5	17.3	55	-34	11	0.56	0.19	0.84	2	6.6
Yearly:											
Average--	55.8	29.3	42.6	---	---	---	---	---	---	---	---
Extreme--	---	---	---	104	-37	---	---	---	---	---	---
Total	---	---	---	---	---	4,073	14.68	12.09	17.34	37	36.3

See footnote at end of table.

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued

[Recorded in the period 1951-78 at Vida, Mont.]

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[1]	Average	Less than--	More than--	Average number of days with 0.1 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January---	21.5	1.1	11.3	51	-33	22	0.73	0.25	1.11	3	10.5
February--	29.5	8.8	19.2	57	-25	24	0.55	0.16	0.85	2	7.1
March-----	38.8	16.8	27.8	72	-20	85	0.70	0.27	1.03	3	7.2
April-----	55.1	30.3	42.7	84	7	170	1.63	0.58	2.47	5	6.7
May-------	68.0	41.5	54.7	93	22	456	2.45	0.83	3.73	6	0.7
June------	76.6	50.3	63.5	97	37	705	3.22	1.73	4.42	7	0.0
July------	84.7	55.7	70.2	104	41	936	2.07	0.69	3.16	5	0.0
August----	84.1	54.1	69.1	102	39	902	1.56	0.36	2.50	3	0.0
September-	71.6	43.6	57.6	96	24	533	1.41	0.33	2.26	4	0.2
October---	60.1	33.9	47.0	87	14	260	0.80	0.16	1.29	2	2.3
November--	41.2	19.7	30.4	70	-12	57	0.49	0.14	0.76	2	5.2
December--	29.5	9.6	19.6	56	-30	34	0.51	0.20	0.75	2	7.0
Yearly:											
Average-	55.1	30.5	42.8	---	---	---	---	---	---	---	---
Extreme-	---	---	---	104	-33	---	---	---	---	---	---
Total---	---	---	---	---	---	4,184	16.12	12.08	19.86	44	46.9

See footnote at end of table.

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued

[Recorded in the period 1951-77 at Fort Peck, Mont.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.1 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January---	22.5	2.1	12.3	52	-33	21	0.38	0.06	0.62	1	5.1
February--	29.5	9.0	19.3	56	-25	30	0.23	0.07	0.34	1	1.8
March-----	40.7	19.5	30.1	71	-16	92	0.34	0.11	0.51	1	6.7
April-----	55.7	32.9	44.3	80	11	186	1.00	0.26	1.59	3	0.0
May-------	68.7	43.7	56.2	91	28	502	1.95	0.58	3.04	4	0.0
June------	78.2	52.8	65.5	96	38	765	2.67	1.57	3.64	5	0.0
July------	86.4	57.6	72.1	103	44	995	1.71	0.72	2.50	4	0.0
August----	85.4	55.9	70.7	101	42	952	1.49	0.29	2.41	3	0.0
September-	72.5	45.8	59.2	95	27	576	1.24	0.14	2.04	2	0.0
October---	60.4	36.7	48.6	85	18	290	0.63	0.11	1.03	2	0.0
November--	42.2	22.4	32.3	67	-10	38	0.29	---	0.48	1	0.0
December--	29.9	10.4	20.2	55	-29	28	0.21	0.07	0.31	0	0.0
Yearly:											
Average-	56.0	32.4	44.2	---	---	---	---	---	---	---	---
Extreme-	---	---	---	103	-33	---	---	---	---	---	---
Total---	---	---	---	---	---	4,475	12.14	8.98	15.08	27	13.6

[1]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 (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1959-78 at Brockway, Mont.]

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--	May 17	May 26	June 11
2 years in 10 later than--	May 11	May 21	June 4
5 years in 10 later than--	May 1	May 11	May 20
First freezing temperature in fall:			
1 year in 10 earlier than--	September 12	September 3	August 28
2 years in 10 earlier than--	September 17	September 9	September 2
5 years in 10 earlier than--	September 28	September 19	September 12

[Recorded in the period 1963-78 at Circle, Mont.]

Last freezing temperature in spring:			
1 year in 10 later than--	May 9	May 19	May 28
2 years in 10 later than--	May 5	May 14	May 23
5 years in 10 later than--	April 27	May 5	May 13
First freezing temperature in fall:			
1 year in 10 earlier than--	September 14	September 6	September 5
2 years in 10 earlier than--	September 21	September 12	September 10
5 years in 10 earlier than--	October 5	September 24	September 19

TABLE 2.--FREEZE DATES IN SPRING AND FALL--Continued
[Recorded in the period 1951-78 at Vida, Mont.]

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--	May 11	May 20	May 31
2 years in 10 later than--	May 6	May 14	May 25
5 years in 10 later than--	April 26	May 3	May 14
First freezing temperature in fall:			
1 year in 10 earlier than--	September 24	September 13	September 4
2 years in 10 earlier than--	September 30	September 19	September 9
5 years in 10 earlier than--	October 11	October 1	September 20

[Recorded in the period 1956-78 at Fort Peck, Mont.]

Last freezing temperature in spring:			
1 year in 10 later than--	May 3	May 10	May 19
2 years in 10 later than--	April 29	May 6	May 14
5 years in 10 later than--	April 19	April 27	May 4
First freezing temperature in fall:			
1 year in 10 earlier than--	October 1	September 18	September 14
2 years in 10 earlier than--	October 7	September 24	September 19
5 years in 10 earlier than--	October 19	October 7	September 28

TABLE 3.--GROWING SEASON

[Recorded in the period 1959-78 at Brockway, Mont.]

Probability	Length of growing season if daily minimum temperature exceeds--		
	24° F	28° F	32° F
	Days	Days	Days
9 years in 10	129	106	81
8 years in 10	136	114	92
5 years in 10	149	131	113
2 years in 10	163	147	135
1 year in 10	169	156	146
[Recorded in the period 1963-78 at Circle, Mont.]			
9 years in 10	134	114	105
8 years in 10	143	123	112
5 years in 10	160	141	127
2 years in 10	178	160	144
1 year in 10	192	174	156
[Recorded in the period 1951-78 at Vida, Mont.]			
9 years in 10	142	129	107
8 years in 10	151	136	114
5 years in 10	168	150	128
2 years in 10	184	163	142
1 year in 10	193	170	149
[Recorded in the period 1956-78 Fort Peck, Mont.]			
9 years in 10	163	145	128
8 years in 10	170	151	134
5 years in 10	182	163	147
2 years in 10	194	174	159
1 year in 10	200	180	165

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Absher clay loam, 8 to 15 percent slopes	1,880	0.1
2	Adger silty clay loam, 0 to 8 percent slopes	1,900	0.1
3	Adger-Absher complex, 0 to 8 percent slopes	1,240	0.1
4	Aeric Fluvaquents, loamy	2,785	0.2
5	Alona silt loam, 0 to 8 percent slopes	15,055	0.9
6	Alona silt loam, saline, 0 to 2 percent slopes	4,465	0.3
7	Badland	35,685	2.1
8	Banks fine sandy loam	2,240	0.1
9	Barkof silty clay, 2 to 8 percent slopes	1,285	0.1
10	Bascovy silty clay, 2 to 8 percent slopes	420	*
11	Bascovy-Sunburst complex, 15 to 45 percent slopes	5,330	0.3
12	Benz clay loam, 0 to 8 percent slopes	1,845	0.1
13	Bowbells loam	1,395	0.1
14	Bryant silt loam, 0 to 4 percent slopes	33,790	2.0
15	Bryant silt loam, 4 to 8 percent slopes	6,605	0.4
16	Bryant-Cambert complex, 2 to 8 percent slopes	51,140	3.1
17	Bryant Variant silt loam, 0 to 2 percent slopes	1,215	0.1
18	Busby fine sandy loam, 2 to 8 percent slopes	2,510	0.2
19	Busby fine sandy loam, 8 to 15 percent slopes	1,260	0.1
20	Busby-Fleak complex, 15 to 45 percent slopes	24,760	1.5
21	Busby-Twilight fine sandy loams, 2 to 8 percent slopes	3,305	0.2
22	Busby-Twilight-Fleak complex, 8 to 15 percent slopes	14,650	0.9
23	Busby-Yamac-Fleak complex, 15 to 45 percent slopes	31,100	1.9
24	Busby-Yetull fine sandy loams, 2 to 8 percent slopes	2,210	0.1
25	Cabba loam, 15 to 25 percent slopes	11,055	0.7
26	Cabba-Badland complex, 15 to 45 percent slopes	17,870	1.1
27	Cabba-Barkof complex, 15 to 45 percent slopes	2,930	0.2
28	Cabba-Brandenburg complex, 8 to 45 percent slopes	2,715	0.2
29	Cabba-Dast complex, 15 to 45 percent slopes	11,950	0.7
30	Cabba-Wabek-Dast complex, 15 to 45 percent slopes	15,455	0.9
31	Cabbart silt loam, 15 to 25 percent slopes	15,365	0.9
32	Cabbart-Badland complex, 15 to 45 percent slopes	41,945	2.5
33	Cabbart-Kirby complex, 8 to 45 percent slopes	7,425	0.4
34	Cabbart-Twilight complex, 15 to 45 percent slopes	17,700	1.1
35	Cabbart-Yawdim complex, 4 to 15 percent slopes	11,030	0.7
36	Cabbart-Yawdim complex, 15 to 45 percent slopes	8,285	0.5
37	Cambert loam, 2 to 8 percent slopes	87,625	5.3
38	Cambert-Barkof-Cabba complex, 4 to 15 percent slopes	9,105	0.5
39	Cambert-Cabba loams, 8 to 15 percent slopes	44,585	2.7
40	Cambert-Dast-Cabba complex, 4 to 15 percent slopes	50,390	3.0
41	Cambeth silt loam, 2 to 8 percent slopes	27,085	1.6
42	Cambeth-Cabbart silt loams, 8 to 15 percent slopes	17,295	1.0
43	Cambeth-Twilight-Cabbart complex, 4 to 15 percent slopes	36,910	2.2
44	Cherry silt loam, 0 to 4 percent slopes	39,945	2.4
45	Cherry-Havrelon-Trembles complex, 0 to 2 percent slopes	16,390	1.0
46	Chinook fine sandy loam, 0 to 4 percent slopes	3,620	0.2
47	Chinook fine sandy loam, 4 to 8 percent slopes	8,530	0.5
48	Chinook fine sandy loam, 8 to 15 percent slopes	830	*
49	Chinook fine sandy loam, gullied, 2 to 8 percent slopes	2,045	0.1
50	Creed loam, 0 to 8 percent slopes	14,900	0.9
51	Creed-Gerdrum complex, 0 to 8 percent slopes	8,615	0.5
52	Dast fine sandy loam, 2 to 8 percent slopes	7,735	0.5
53	Dast fine sandy loam, 8 to 15 percent slopes	5,300	0.3
54	Dast-Blanchard complex, 2 to 8 percent slopes	1,005	0.1
55	Dast-Blanchard complex, 8 to 25 percent slopes	3,650	0.2
56	Dimmick silty clay	1,480	0.1
57	Dimmick clay, drained	920	0.1
58	Ethridge silty clay loam, 0 to 4 percent slopes	4,875	0.3
59	Ethridge silty clay loam, 4 to 8 percent slopes	1,350	0.1
60	Evanston loam, 0 to 2 percent slopes	1,825	0.1
61	Evanston loam, 2 to 8 percent slopes	2,645	0.2
62	Evanston-Gerdrum complex, 2 to 8 percent slopes	4,735	0.3
63	Farland silt loam, 0 to 4 percent slopes	2,015	0.1
64	Farnuf loam, 0 to 4 percent slopes	5,105	0.3
65	Floweree silt loam, 0 to 4 percent slopes	18,780	1.1
66	Floweree silt loam, 4 to 8 percent slopes	6,855	0.4
67	Floweree-Cambeth silt loams, 2 to 8 percent slopes	24,700	1.5
68	Gerdrum clay loam, 0 to 8 percent slopes	20,705	1.2
69	Gerdrum clay loam, gullied, 8 to 15 percent slopes	2,235	0.1
70	Gerdrum-Absher clay loams, 0 to 8 percent slopes	12,810	0.8

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
71	Gerdrum-Yawdim-Fleak complex, 0 to 8 percent slopes	1,950	0.1
72	Gerdrum-Yawdim-Fleak complex, 8 to 45 percent slopes	3,715	0.2
73	Glendive sandy loam	1,060	0.1
74	Glendive loam	3,395	0.2
75	Glendive loam, protected	450	*
76	Glendive silty clay loam	375	*
77	Glendive silty clay loam, protected	960	0.1
78	Glendive-Hanly complex, protected	720	*
79	Hanly loamy fine sand	2,110	0.1
80	Harlem silty clay	805	*
81	Harlem silty clay, protected	5,870	0.4
82	Havre silt loam	3,530	0.2
83	Havre silt loam, protected	675	*
84	Havre silty clay loam	300	*
85	Havre silty clay loam, protected	3,000	0.2
86	Havrelon loam	8,300	0.5
87	Havrelon loam, protected	1,815	0.1
88	Havrelon loam, saline	2,735	0.2
89	Havrelon silty clay loam	1,260	0.1
90	Havrelon silty clay loam, protected	3,040	0.2
91	Hillon loam, 2 to 8 percent slopes	1,785	0.1
92	Hillon loam, 8 to 15 percent slopes	5,980	0.4
93	Hillon loam, 15 to 45 percent slopes	7,020	0.4
94	Hillon-Badland complex, 15 to 45 percent slopes	2,335	0.1
95	Hillon-Yamac-Fleak complex, 15 to 45 percent slopes	10,750	0.6
96	Hoffmanville silty clay, protected	300	*
97	Kremlin loam, 0 to 4 percent slopes	5,300	0.3
98	Kremlin loam, 4 to 8 percent slopes	5,315	0.3
99	Lehr loam, 2 to 8 percent slopes	4,055	0.2
100	Lisk sandy loam, 2 to 8 percent slopes	2,615	0.2
101	Lisk sandy loam, 8 to 15 percent slopes	1,170	0.1
102	Lohler silty clay loam, protected	2,260	0.1
103	Lohler silty clay	235	*
104	Lohler silty clay, protected	700	*
105	Lonna silty clay loam, 0 to 4 percent slopes	10,000	0.6
106	Lonna-Havre-Glendive complex, 0 to 2 percent slopes	12,865	0.8
107	Macar loam, 0 to 4 percent slopes	9,430	0.6
108	Macar loam, 4 to 8 percent slopes	10,200	0.6
109	Macar loam, 8 to 15 percent slopes	750	*
110	Macar loam, saline, 0 to 4 percent slopes	925	0.1
111	Macar-Cabba loams, 8 to 15 percent slopes	1,490	0.1
112	Macar-Cambert loams, 2 to 8 percent slopes	14,085	0.8
113	Marias clay	1,410	0.1
114	Marvan clay, 0 to 8 percent slopes	3,740	0.2
115	Neldore-Badland-Bascovy complex, 15 to 45 percent slopes	9,325	0.6
116	Neldore-Bascovy complex, 2 to 15 percent slopes	3,060	0.2
117	Neldore-Yamac-Badland complex, 15 to 45 percent slopes	3,860	0.2
118	Pendroy clay	2,120	0.1
119	Ridgelawn silt loam	1,155	0.1
120	Rominell loam, 0 to 8 percent slopes	11,510	0.7
121	Rominell loam, gullied, 0 to 8 percent slopes	13,035	0.8
122	Rominell-Yamac loams, 4 to 15 percent slopes	855	0.1
123	Savage silty clay loam, 0 to 4 percent slopes	2,055	0.1
124	Shambo loam, 0 to 4 percent slopes	15,825	1.0
125	Shambo loam, 4 to 8 percent slopes	8,685	0.5
126	Shambo-Cabba loams, 8 to 15 percent slopes	1,380	0.1
127	Shambo-Cambert loams, 2 to 8 percent slopes	38,680	2.3
128	Sunburst clay loam, 2 to 8 percent slopes	865	0.1
129	Sunburst clay loam, 8 to 15 percent slopes	2,400	0.1
130	Sunburst clay loam, 15 to 45 percent slopes	6,675	0.4
131	Tally fine sandy loam, 0 to 4 percent slopes	2,070	0.1
132	Tally fine sandy loam, 4 to 8 percent slopes	2,420	0.1
133	Telstad loam, 2 to 8 percent slopes	4,935	0.3
134	Telstad-Hillon loams, 2 to 8 percent slopes	14,550	0.9
135	Telstad-Hillon loams, 8 to 15 percent slopes	1,830	0.1
136	Telstad-Thoeny loams, 2 to 8 percent slopes	1,015	0.1
137	Thoeny loam, 2 to 8 percent slopes	6,010	0.4
138	Thoeny-Absher complex, 2 to 8 percent slopes	2,680	0.2
139	Trembles fine sandy loam	5,880	0.4
140	Trembles fine sandy loam, protected	660	*

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
141	Turner loam, 0 to 4 percent slopes	850	0.1
142	Twilight-Yetull fine sandy loams, 8 to 15 percent slopes	4,645	0.3
143	Typic Fluvaquents, frequently flooded	4,895	0.3
144	Typic Fluvaquents, saline	17,085	1.0
145	Typic Ustifluvents, saline	1,420	0.1
146	Typic Ustorthents-Typic Ustifluvents association	13,300	0.8
147	Ustic Torriorthents-Ustic Torrifluvents association	15,950	1.0
148	Vanda clay, 0 to 8 percent slopes	1,830	0.1
149	Vida clay loam, 0 to 2 percent slopes	3,460	0.2
150	Vida clay loam, 2 to 8 percent slopes	9,015	0.5
151	Vida-Zahill complex, 2 to 8 percent slopes	89,060	5.4
152	Vida-Zahill complex, 8 to 15 percent slopes	4,025	0.2
153	Wabek sandy loam, 4 to 15 percent slopes	790	*
154	Wabek sandy loam, 15 to 45 percent slopes	205	*
155	Weingart clay, 2 to 8 percent slopes	2,455	0.1
156	Williams loam, 0 to 2 percent slopes	12,325	0.7
157	Williams loam, 2 to 4 percent slopes	4,690	0.3
158	Williams-Vida complex, 2 to 4 percent slopes	25,020	1.5
159	Yamac loam, 0 to 4 percent slopes	3,135	0.2
160	Yamac loam, 4 to 8 percent slopes	17,085	1.0
161	Yamac loam, 8 to 15 percent slopes	4,720	0.3
162	Yamac-Twilight complex, 2 to 8 percent slopes	5,640	0.3
163	Yamac-Twilight-Fleak complex, 8 to 15 percent slopes	7,995	0.5
164	Yawdim silty clay, 2 to 8 percent slopes	2,825	0.2
165	Yawdim-Badland-Cabbart association	26,865	1.6
166	Yawdim-Badland-Gerdrum association	19,420	1.2
167	Yawdim-Kirby complex, 8 to 35 percent slopes	475	*
168	Zahill loam, 2 to 8 percent slopes	13,800	0.8
169	Zahill loam, 8 to 15 percent slopes	20,000	1.2
170	Zahill loam, 15 to 45 percent slopes	26,920	1.6
171	Zahill-Badland complex, 25 to 45 percent slopes	9,100	0.5
172	Zahill-Cabba loams, 8 to 15 percent slopes	19,315	1.2
173	Zahill-Cabba loams, 15 to 45 percent slopes	12,605	0.8
174	Zahill-Yawdim complex, 4 to 15 percent slopes	2,415	0.1
175	Zahill-Yawdim complex, 15 to 45 percent slopes	4,345	0.3
	Water	19,775	1.2
	Total	1,660,160	100.0

* Less than 0.05 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. 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	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
8--- Banks	---	---	---	35	---	42	---	45	---	4.0
9--- Barkof	25	---	21	---	35	---	39	---	---	---
13--- Bowbells	37	---	32	---	47	---	62	---	---	---
14--- Bryant	32	---	27	---	41	---	53	---	---	---
15--- Bryant	30	---	25	---	36	---	50	---	---	---
16--- Bryant-Cambert	28	---	24	---	34	---	47	---	---	---
18--- Busby	15	---	12	---	19	---	21	---	---	---
19--- Busby	14	---	11	---	18	---	20	---	---	---
21--- Busby-Twilight	14	---	11	---	18	---	20	---	---	---
24--- Busby-Yetull	12	---	10	---	16	---	18	---	---	---
37--- Cambert	26	---	22	---	32	---	43	---	---	---
38--- Cambert-Barkof-Cabba	18	---	15	---	23	---	26	---	---	---
39--- Cambert-Cabba	18	---	15	---	23	---	26	---	---	---
40--- Cambert-Dast-Cabba	18	---	15	---	23	---	26	---	---	---
41--- Cambeth	25	---	21	---	31	---	42	---	---	---
42--- Cambeth-Cabbart	17	---	14	---	22	---	25	---	---	---
43--- Cambeth-Twilight-Cabbart	17	---	14	---	22	---	25	---	---	---
44--- Cherry	30	---	25	45	37	70	48	85	---	5.5
45--- Cherry-Havrelon-Trembles	28	---	23	42	35	67	46	79	---	5.2

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
46--Chinook	24	---	20	---	29	---	31	---	---	---
47--Chinook	22	---	18	---	27	---	29	---	---	---
48--Chinook	15	---	12	---	19	---	21	---	---	---
50--Creed	20	---	14	---	24	---	31	---	---	---
51--Creed-Gerdrum	19	---	13	---	23	---	30	---	---	---
52--Dast	21	---	17	---	26	---	27	---	---	---
53--Dast	14	---	12	---	18	---	20	---	---	---
54--Dast-Blanchard	13	---	11	---	17	---	19	---	---	---
57--Dimmick	22	---	19	---	31	---	35	---	---	---
58--Ethridge	30	---	20	---	41	---	46	---	---	---
59--Ethridge	28	---	21	---	38	---	43	---	---	---
60--Evanston	33	---	28	---	44	---	58	---	---	---
61--Evanston	31	---	24	---	37	---	53	---	---	---
62--Evanston-Gerdrum	25	---	19	---	30	---	41	---	---	---
63--Farland	34	---	29	---	45	---	59	---	---	---
64--Farnuf	34	---	29	---	45	---	59	---	---	---
65--Floweree	31	---	26	---	40	---	52	---	---	---
66--Floweree	29	---	24	---	35	---	49	---	---	---
67--Floweree-Cambeth	27	---	23	---	33	---	46	---	---	---
68--Gerdrum	18	---	12	---	22	---	29	---	---	---

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
73, 74---------- Glendive	21	---	17	40	26	50	27	65	---	4.5
75---------- Glendive	21	---	17	40	26	60	27	70	---	5.0
76, 77---------- Glendive	21	---	17	42	26	62	27	70	---	5.0
78---------- Glendive-Hanly	---	---	---	35	---	42	---	45	---	4.0
80, 81---------- Harlem	27	---	22	40	34	60	45	75	---	5.0
82, 83, 84, 85---------- Havre	27	---	22	40	34	70	45	90	---	5.0
86, 87---------- Havrelon	28	---	23	40	35	70	46	90	---	5.2
89, 90---------- Havrelon	28	---	23	45	35	70	46	90	---	5.2
91---------- Hillon	26	---	22	---	32	---	43	---	---	---
92---------- Hillon	23	---	19	---	28	---	33	---	---	---
96---------- Hoffmanville	25	---	21	38	31	60	36	70	---	4.3
97---------- Kremlin	31	---	26	---	40	---	52	---	---	---
98---------- Kremlin	29	---	24	---	35	---	49	---	---	---
99---------- Lehr	26	---	21	---	31	---	35	---	---	---
100---------- Lisk	22	---	18	--	27	---	28	---	---	---
101---------- Lisk	15	---	12	---	19	---	21	---	---	---
102, 103, 104---------- Lohler	28	---	23	45	35	60	46	80	---	5.0
105---------- Lonna	29	---	24	---	36	---	47	---	---	---
106---------- Lonna-Havre-Glendive	27	---	22	45	34	69	45	81	---	5.0
107---------- Macar	30	---	25	---	37	---	48	---	---	---
108---------- Macar	27	---	23	---	33	---	44	---	---	---

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
109--Macar	24	---	20	---	29	---	34	---	---	---
110--Macar	21	---	16	---	25	---	32	---	---	---
111--Macar-Cabba	20	---	17	---	25	---	28	---	---	---
112--Macar-Cambert	26	---	22	---	32	---	43	---	---	---
113--Marias	26	---	22	---	37	---	43	---	---	---
114--Marvan	18	---	12	---	22	---	29	---	---	---
118--Pendroy	22	---	19	40	31	50	35	70	---	3.5
119--Ridgelawn	26	---	22	40	32	60	37	70	---	5.0
120--Rominell	18	---	12	---	22	---	29	---	---	---
122--Rominell-Yamac	21	---	16	---	25	---	33	---	---	---
123--Savage	31	---	24	---	42	---	47	---	---	---
124--Shambo	32	---	27	---	41	---	53	---	---	---
125--Shambo	30	---	25	---	36	---	50	---	---	---
126--Shambo-Cabba	23	---	19	---	28	---	31	---	---	---
127--Shambo-Cambert	28	---	24	---	34	---	47	---	---	---
128--Sunburst	23	---	17	---	30	---	34	---	---	---
129--Sunburst	19	---	15	---	26	---	29	---	---	---
131--Tally	25	---	21	---	30	---	32	---	---	---
132--Tally	23	---	19	---	28	---	30	---	---	---
133--Telstad	32	---	25	---	38	---	54	---	---	---

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
134---------- Telstad-Hillon	29	---	24	---	35	---	49	---	---	---
135---------- Telstad-Hillon	26	---	21	---	31	---	37	---	---	---
136---------- Telstad-Thoeny	26	---	20	---	31	---	37	---	---	---
137---------- Thoeny	21	---	15	---	25	---	32	---	---	---
138---------- Thoeny-Absher	15	---	10	---	17	---	22	---	---	---
139,140---------- Trembles	22	---	18	38	27	60	28	65	---	4.5
141---------- Turner	30	---	25	---	39	---	45	---	---	---
149---------- Vida	35	---	30	---	46	---	60	---	---	---
150---------- Vida	33	---	26	---	39	---	55	---	---	---
151---------- Vida-Zahill	30	---	25	---	36	---	50	---	---	---
152---------- Vida-Zahill	27	---	22	---	32	---	38	---	---	---
156---------- Williams	36	---	31	---	47	---	61	---	---	---
157---------- Williams	34	---	27	---	40	---	56	---	---	---
158---------- Williams-Vida	33	---	26	---	39	---	55	---	---	---
159---------- Yamac	29	---	24	---	36	---	47	---	---	---
160---------- Yamac	26	---	22	---	32	---	43	---	---	---
161---------- Yamac	23	---	19	---	28	---	33	---	---	---
162---------- Yamac-Twilight	20	---	17	---	25	---	28	---	---	---

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Winter wheat		Spring wheat		Barley		Oats		Alfalfa hay	
	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Ton	Ton
168---------- Zahill	27	---	23	---	33	---	44	---	---	---
169---------- Zahill	24	---	20	---	29	---	34	---	---	---
172---------- Zahill-Cabba	20	---	17	---	25	---	28	---	---	---

TABLE 6.--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
1---------- Absher	Severe: excess sodium.	Severe: excess sodium.	Severe: slope, excess sodium.	Severe: erodes easily.
2---------- Adger	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.
3*:				
Adger----------	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: erodes easily.
Absher----------	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
4. Aeric Fluvaquents				
5---------- Alona	Moderate: slope, dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
6---------- Alona	Severe: flooding.	Moderate: excess salt, dusty.	Moderate: dusty, excess salt.	Severe: erodes easily.
7. Badland				
8---------- Banks	Severe: flooding.	Slight----------	Slight----------	Slight.
9---------- Barkof	Moderate: too clayey.	Moderate: too clayey.	Moderate: slope, too clayey.	Moderate: too clayey.
10---------- Bascovy	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: slope, small stones.	Severe: erodes easily.
11*:				
Bascovy----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Sunburst----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
12---------- Benz	Moderate: excess salt.	Moderate: excess salt.	Moderate: slope, excess salt.	Severe: erodes easily.
13---------- Bowbells	Slight----------	Slight----------	Slight----------	Slight.
14---------- Bryant	Slight----------	Slight----------	Moderate: slope.	Slight.
15---------- Bryant	Slight----------	Slight----------	Severe: slope.	Slight.
16*:				
Bryant----------	Slight----------	Slight----------	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
16*:				
Cambert	Slight	Slight	Moderate: slope.	Severe: erodes easily.
17-- Bryant Variant	Severe: excess salt.	Severe: excess salt.	Severe: excess salt.	Severe: erodes easily.
18-- Busby	Slight	Slight	Moderate: slope.	Slight.
19-- Busby	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
20*:				
Busby	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Fleak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
21*:				
Busby	Slight	Slight	Moderate: slope.	Slight.
Twilight	Slight	Slight	Moderate: slope.	Slight.
22*:				
Busby	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Twilight	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Fleak	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
23*:				
Busby	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Yamac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Fleak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
24*:				
Busby	Slight	Slight	Moderate: slope.	Slight.
Yetull	Slight	Slight	Moderate: slope.	Slight.
25-- Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
26*:				
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Badland.				

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
27*:				
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Barkof	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
28*:				
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
Brandenburg	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.
29*:				
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Dast	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
30*:				
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Wabek	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Dast	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
31	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
Cabbart				
32*:				
Cabbart	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Badland.				
33*:				
Cabbart	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
Kirby	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.
34*:				
Cabbart	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Twilight	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
35*:				
Cabbart	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
35*:				
Yawdim	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: too clayey.
36*:				
Cabbart	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
37--- Cambert	Slight	Slight	Moderate: slope.	Severe: erodes easily.
38*:				
Cambert	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Barkof	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
Cabba	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
39*:				
Cambert	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Cabba	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
40*:				
Cambert	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Dast	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Cabba	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
41--- Cambeth	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
42*:				
Cambeth	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
Cabbart	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
43*:				
Cambeth	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
Twilight	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
43*: Cabbart	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
44 Cherry	Slight	Slight	Moderate: slope.	Severe: erodes easily.
45*: Cherry	Slight	Slight	Slight	Severe: erodes easily.
Havrelon	Severe: flooding.	Slight	Moderate: flooding.	Slight.
Trembles	Severe: flooding.	Slight	Moderate: flooding.	Slight.
46 Chinook	Slight	Slight	Moderate: slope.	Slight.
47 Chinook	Slight	Slight	Severe: slope.	Slight.
48 Chinook	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
49 Chinook	Slight	Slight	Moderate: slope.	Slight.
50 Creed	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
51*: Creed	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
52 Dast	Slight	Slight	Moderate: slope, small stones.	Slight.
53 Dast	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
54*: Dast	Slight	Slight	Moderate: slope, small stones.	Slight.
Blanchard	Slight	Slight	Moderate: slope.	Slight.
55*: Dast	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Blanchard	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
56, 57 Dimmick	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.
58 Ethridge	Slight	Slight	Moderate: slope.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
59--Ethridge	Slight	Slight	Severe: slope.	Severe: erodes easily.
60--Evanston	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Severe: erodes easily.
61--Evanston	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
62*:				
Evanston	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
63--Farland	Slight	Slight	Moderate: slope.	Severe: erodes easily.
64--Farnuf	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
65--Floweree	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
66--Floweree	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Severe: erodes easily.
67*:				
Floweree	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
Cambeth	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
68--Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
69--Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: slope, excess sodium.	Severe: erodes easily.
70*:				
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
Absher	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
71*:				
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
Yawdim	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: too clayey.
Fleak	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
72*:				
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: slope, excess sodium.	Severe: erodes easily.
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Fleak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
73--- Glendive	Severe: flooding.	Slight	Slight	Slight.
74--- Glendive	Severe: flooding.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
75--- Glendive	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
76--- Glendive	Severe: flooding.	Slight	Slight	Slight.
77--- Glendive	Slight	Slight	Slight	Slight.
78*:				
Glendive	Slight	Slight	Slight	Slight.
Hanly	Slight	Slight	Slight	Slight.
79--- Hanly	Severe: flooding.	Slight	Moderate: flooding.	Slight.
80--- Harlem	Severe: flooding.	Moderate: too clayey.	Moderate: too clayey.	Slight.
81--- Harlem	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Slight.
82--- Havre	Severe: flooding.	Slight	Slight	Slight.
83--- Havre	Slight	Slight	Slight	Severe: erodes easily.
84--- Havre	Severe: flooding.	Slight	Slight	Slight.
85--- Havre	Slight	Slight	Slight	Slight.
86--- Havrelon	Severe: flooding.	Slight	Slight	Slight.
87--- Havrelon	Slight	Slight	Slight	Slight.
88--- Havrelon	Severe: flooding.	Slight	Moderate: flooding.	Severe: erodes easily.
89--- Havrelon	Severe: flooding.	Slight	Slight	Slight.
90--- Havrelon	Slight	Slight	Slight	Slight.
91--- Hillon	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
92--Hillon	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
93--Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
94*: Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Badland.				
95*: Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Yamac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Fleak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
96--Hoffmanville	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Slight.
97--Kremlin	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Severe: erodes easily.
98--Kremlin	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Severe: erodes easily.
99--Lehr	Slight	Slight	Moderate: slope.	Slight.
100--Lisk	Slight	Slight	Moderate: slope.	Slight.
101--Lisk	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
102--Lohler	Slight	Slight	Slight	Slight.
103--Lohler	Severe: flooding.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
104--Lohler	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
105--Lonna	Slight	Slight	Moderate: slope.	Slight.
106*: Lonna	Slight	Slight	Slight	Slight.
Havre	Severe: flooding.	Moderate: dusty.	Moderate: flooding, dusty.	Severe: erodes easily.
Glendive	Severe: flooding.	Slight	Moderate: flooding.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
107 Macar	Slight	Slight	Moderate: slope.	Severe: erodes easily.
108 Macar	Slight	Slight	Severe: slope.	Severe: erodes easily.
109 Macar	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
110 Macar	Slight	Slight	Moderate: slope.	Severe: erodes easily.
111*: Macar	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Cabba	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
112*: Macar	Slight	Slight	Moderate: slope.	Severe: erodes easily.
Cambert	Slight	Slight	Moderate: slope.	Severe: erodes easily.
113 Marias	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: too clayey, percs slowly.	Severe: erodes easily.
114 Marvan	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: slope, too clayey, percs slowly.	Severe: erodes easily.
115*: Neldore	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Badland.				
Bascovy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
116*: Neldore	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Bascovy	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: slope, small stones.	Severe: erodes easily.
117*: Neldore	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Yamac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Badland.				
118 Pendroy	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: too clayey, percs slowly.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
119--- Ridgelawn	Severe: flooding.	Slight	Slight	Severe: erodes easily.
120, 121--- Rominell	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
122*: Rominell---	Severe: excess sodium.	Severe: excess sodium.	Severe: slope, excess sodium.	Severe: erodes easily.
Yamac---	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
123--- Savage	Slight	Slight	Moderate: slope.	Severe: erodes easily.
124--- Shambo	Slight	Slight	Moderate: slope.	Slight.
125--- Shambo	Slight	Slight	Severe: slope.	Slight.
126*: Shambo---	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Cabba---	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
127*: Shambo---	Slight	Slight	Moderate: slope.	Slight.
Cambert---	Slight	Slight	Moderate: slope.	Severe: erodes easily.
128--- Sunburst	Slight	Slight	Moderate: slope, small stones.	Slight.
129--- Sunburst	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
130--- Sunburst	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
131--- Tally	Slight	Slight	Moderate: slope, small stones.	Slight.
132--- Tally	Slight	Slight	Severe: slope.	Slight.
133--- Telstad	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
134*: Telstad---	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
134*:				
Hillon	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Severe: erodes easily.
135*:				
Telstad	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Hillon	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
136*:				
Telstad	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
Thoeny	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
137 Thoeny	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
138*:				
Thoeny	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
Absher	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
139 Trembles	Severe: flooding.	Slight	Slight	Slight.
140 Trembles	Slight	Slight	Slight	Slight.
141 Turner	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
142*:				
Twilight	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Yetull	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
143, 144. Typic Fluvaquents				
145. Typic Ustifluvents				
146*: Typic Ustorthents.				
Typic Ustifluvents.				
147*: Ustic Torriorthents.				
Ustic Torrifluvents.				
148 Vanda	Severe: excess salt.	Severe: excess salt.	Severe: excess salt.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
149--Vida	Slight	Slight	Moderate: small stones.	Slight.
150--Vida	Slight	Slight	Moderate: slope, small stones.	Slight.
151*:				
Vida	Slight	Slight	Moderate: slope, small stones.	Slight.
Zahill	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
152*:				
Vida	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Zahill	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
153--Wabek	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
154--Wabek	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
155--Weingart	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
156--Williams	Slight	Slight	Slight	Slight.
157--Williams	Slight	Slight	Moderate: slope.	Slight.
158*:				
Williams	Slight	Slight	Moderate: slope.	Slight.
Vida	Slight	Slight	Moderate: slope, small stones.	Slight.
159--Yamac	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Severe: erodes easily.
160--Yamac	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Severe: erodes easily.
161--Yamac	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
162*:				
Yamac	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Severe: erodes easily.
Twilight	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
163*:				
Yamac	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
Twilight	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Fleak	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
164 Yawdim	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: too clayey.
165*:				
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Badland.				
Cabbart	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
166*:				
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Badland.				
Gerdrum	Severe: excess sodium.	Severe: excess sodium.	Severe: slope, excess sodium.	Severe: erodes easily.
167*:				
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: too clayey, slope.
Kirby	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones.
168 Zahill	Slight	Slight	Moderate: slope, small stones.	Severe: erodes easily.
169 Zahill	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
170 Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
171*:				
Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Badland.				
172*:				
Zahill	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
172*:				
Cabba	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
173*:				
Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Cabba	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
174*:				
Zahill	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Yawdim	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: too clayey.
175*:				
Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Yawdim	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--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]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1 Absher	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
2 Adger	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess salt, excess sodium.
3*: Adger	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess salt, excess sodium.
Absher	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
4. Aeric Fluvaquents						
5 Alona	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
6 Alona	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Moderate: excess salt.
7. Badland						
8 Banks	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
9 Barkof	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
10 Bascovy	Moderate: too clayey.	Severe: shrink-swell.	Severe: slippage, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
11*: Bascovy	Severe: slippage, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, slope, shrink-swell.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, slope.	Severe: slope, too clayey.
Sunburst	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
12 Benz	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: excess salt, droughty.
13 Bowbells	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
14 Bryant	Slight	Slight	Slight	Slight	Moderate: low strength, frost action.	Slight.
15 Bryant	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 7.--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
16*:						
Bryant	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
Cambert	Slight	Moderate: slope, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: thin layer.
17--- Bryant Variant	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength, frost action.	Severe: excess salt.
18--- Busby	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
19--- Busby	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
20*:						
Busby	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Fleak	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
21*:						
Busby	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Twilight	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, thin layer.
22*:						
Busby	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Twilight	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, thin layer.
Fleak	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: thin layer.
23*:						
Busby	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Yamac	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Fleak	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
24*:						
Busby	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Yetull	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.

TABLE 7.--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
25---------- Cabba	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
26*: Cabba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Badland.						
27*: Cabba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Barkof----------	Severe: slippage, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, slope, shrink-swell.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, slope.	Severe: slope, too clayey.
28*: Cabba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Brandenburg------	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: small stones, slope.
29*: Cabba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Dast----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
30*: Cabba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Wabek----------	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dast----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
31---------- Cabbart	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
32*: Cabbart----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Badland.						
33*: Cabbart----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Kirby----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.

See footnote at end of table.

TABLE 7.--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
34*:						
Cabbart	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Twilight	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35*:						
Cabbart	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Severe: thin layer.
Yawdim	Severe: slippage.	Severe: shrink-swell, slippage.	Severe: depth to rock, shrink-swell, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, shrink-swell, slippage.	Severe: thin layer, too clayey.
36*:						
Cabbart	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
Yawdim	Severe: slippage, slope.	Severe: shrink-swell, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope, thin layer, too clayey.
37---- Cambert	Slight	Moderate: slope, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: thin layer.
38*:						
Cambert	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope, thin layer.
Barkof	Severe: slippage.	Severe: slippage, shrink-swell.	Severe: slippage, shrink-swell.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, shrink-swell.	Severe: too clayey.
Cabba	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
39*:						
Cambert	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope, thin layer.
Cabba	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
40*:						
Cambert	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope, thin layer.
Dast	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, thin layer.

TABLE 7.--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
40*: Cabba	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
41 Cambeth	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: thin layer.
42*: Cambeth	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Cabbart	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Severe: thin layer.
43*: Cambeth	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Twilight	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, thin layer.
Cabbart	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Severe: thin layer.
44 Cherry	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
45*: Cherry	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Havrelon	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Trembles	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
46 Chinook	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
47 Chinook	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
48 Chinook	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
49 Chinook	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
50 Creed	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
51*: Creed	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.

See footnote at end of table.

TABLE 7.--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
1*: Gerdrum	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
2 Dast	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
3 Dast	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, thin layer.
4*: Dast	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: thin layer.
Blanchard	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
5*: Dast	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Blanchard	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
56, 57 Dimmick	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
58, 59 Ethridge	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
60 Evanston	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Slight.
61 Evanston	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
62*: Evanston	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
Gerdrum	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Excess sodium.
63 Farland	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
64 Farnuf	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action, shrink-swell.	Slight.
65 Floweree	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
66 Floweree	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 7.--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
67*:						
Floweree	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Cambeth	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: thin layer.
68--- Gerdrum	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Excess sodium.
69--- Gerdrum	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Excess sodium.
70*:						
Gerdrum	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Excess sodium.
Absher	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
71*:						
Gerdrum	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Excess sodium.
Yawdim	Severe: slippage.	Severe: shrink-swell, slippage.	Severe: depth to rock, shrink-swell, slippage.	Severe: shrink-swell, slippage.	Severe: low strength, shrink-swell, slippage.	Severe: thin layer, too clayey.
Fleak	Slight	Slight	Slight	Moderate: slope.	Slight	Severe: thin layer.
72*:						
Gerdrum	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Excess sodium.
Yawdim	Severe: slippage, slope.	Severe: shrink-swell, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope, thin layer, too clayey.
Fleak	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
73, 74--- Glendive	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
75--- Glendive	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
76--- Glendive	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
77--- Glendive	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
78*:						
Glendive	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 7.--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
78*: Hanly	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
79--- Hanly	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
80--- Harlem	Moderate: too clayey.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
81--- Harlem	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
82--- Havre	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
83--- Havre	Slight	Slight	Slight	Slight	Slight	Slight.
84--- Havre	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
85--- Havre	Slight	Slight	Slight	Slight	Slight	Slight.
86--- Havrelon	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
87--- Havrelon	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
88--- Havrelon	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
89--- Havrelon	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
90--- Havrelon	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
91--- Hillon	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
92--- Hillon	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
93--- Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
94*: Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Badland.						
95*: Hillon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Yamac	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 7.--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
95*: Fleak	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
96--- Hoffmanville	Severe: cutbanks cave.	Severe: shrink-swell.	Slight	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
97--- Kremlin	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Slight.
98--- Kremlin	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Slight.
99--- Lehr	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
100--- Lisk	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
101--- Lisk	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
102--- Lohler	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
103--- Lohler	Moderate: too clayey, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
104--- Lohler	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
105--- Lonna	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
106*: Lonna	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Havre	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Glendive	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
107--- Macar	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Slight.
108--- Macar	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
109--- Macar	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
110--- Macar	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action, shrink-swell.	Slight.

See footnote at end of table.

TABLE 7.--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
111*:						
Macar	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Cabba	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
112*:						
Macar	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
Cambert	Slight	Moderate: slope, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: thin layer.
113--- Marias	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
114--- Marvan	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
115*:						
Neldore	Severe: slippage, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, depth to rock, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, slope.	Severe: slope, thin layer, too clayey.
Badland.						
Bascovy	Severe: slippage, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, slope, shrink-swell.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, slope.	Severe: slope, too clayey.
116*:						
Neldore	Severe: slippage.	Severe: slippage, shrink-swell.	Severe: slippage, depth to rock, shrink-swell.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, shrink-swell.	Severe: thin layer, too clayey.
Bascovy	Moderate: too clayey.	Severe: shrink-swell.	Severe: slippage, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
117*:						
Neldore	Severe: slippage, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, depth to rock, slope.	Severe: slippage, shrink-swell, slope.	Severe: slippage, low strength, slope.	Severe: slope, thin layer, too clayey.
Yamac	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Badland.						
118--- Pendroy	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: too clayey.
119--- Ridgelawn	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.

TABLE 7.--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
120, 121---------- Rominell	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Severe: excess sodium.
122*: Rominell---------	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Severe: excess sodium.
Yamac----------	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell.	Moderate: slope.
123---------- Savage	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
124---------- Shambo	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Slight.
125---------- Shambo	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
126*: Shambo----------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Cabba----------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
127*: Shambo----------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
Cambert----------	Slight---------	Moderate: slope, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: thin layer.
128---------- Sunburst	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
129---------- Sunburst	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
130---------- Sunburst	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
131---------- Tally	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
132---------- Tally	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
133---------- Telstad	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength.	Slight.

See footnote at end of table.

TABLE 7.--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
34* Telstad	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength.	Slight.
Hillon	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
35*: Telstad	Moderate: shrink-swell,	Moderate: slope, shrink-swell.	Moderate: slope.	Severe: low strength, slope.	Moderate:	Slight.
Hillon	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
36* Telstad	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength.	Slight.
Thoeny	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: excess sodium.
37-- Thoeny	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: excess sodium.
38* Thoeny	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate; shrink-swell, slope.	Severe: low strength.	Severe: excess sodium.
Absher	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium.
39-- Trembles	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
40-- Trembles	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
41-- Turner	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell. frost action.	Moderate: low strength,	Moderate: droughty.
42*: Twilight	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, thin layer.
Yetull	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
43, 144. Typic Fluvaquents						
45. Typic Ustifluvents						

See footnotes at end of table.

TABLE 7.--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
146*: Typic Ustorthents. Typic Ustifluvents.						
147*: Ustic Torriorthents. Ustic Torrifluvents.						
148--- Vanda	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess salt, too clayey.
149--- Vida	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Moderate: large stones.
150--- Vida	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: large stones.
151*: Vida---	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: large stones.
Zahill---	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: large stones.
152*: Vida---	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
Zahill---	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
153--- Wabek	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
154--- Wabek	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
155--- Weingart	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: excess sodium, too clayey.
156, 157--- Williams	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
158*: Williams---	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Vida---	Slight---	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action.	Moderate: large stones.

See footnote at end of table.

TABLE 7.--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
159---------- Yamac	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Slight.
160---------- Yamac	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
161---------- Yamac	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell.	Moderate: slope.
162*: Yamac----------	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
Twilight---------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty, thin layer.
163*: Yamac----------	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell.	Moderate: slope.
Twilight---------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, thin layer.
Fleak----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: thin layer.
164---------- Yawdim	Slight---------	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: thin layer, too clayey.
165*: Yawdim----------	Severe: slippage, slope.	Severe: shrink-swell, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope, thin layer, too clayey.
Badland.						
Cabbart----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
166*: Yawdim----------	Severe: slippage, slope.	Severe: shrink-swell, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope, thin layer, too clayey.
Badland.						
Gerdrum----------	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Excess sodium.
167*: Yawdim----------	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, thin layer, too clayey.
Kirby----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.

TABLE 7.--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
168--Zahill	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Moderate: large stones.
169--Zahill	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
170--Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
171*: Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Badland.						
172*: Zahill	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
Cabba	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: thin layer.
173*: Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cabba	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, thin layer.
174*: Zahill	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
Yawdim	Severe: slippage.	Severe: shrink-swell, slippage.	Severe: depth to rock, shrink-swell, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, shrink-swell, slippage.	Severe: thin layer, too clayey.
175*: Zahill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Yawdim	Severe: slippage, slope.	Severe: shrink-swell, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: shrink-swell, slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope, thin layer, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1---------- Absher	Severe: percs slowly.	Severe: slope.	Severe: excess salt.	Slight----------	Poor: hard to pack.
2---------- Adger	Severe: percs slowly.	Moderate: slope.	Severe: too clayey, excess sodium, excess salt.	Slight----------	Poor: too clayey, hard to pack, excess salt.
3*: Adger----------	Severe: percs slowly.	Moderate: slope.	Severe: too clayey, excess sodium, excess salt.	Slight----------	Poor: too clayey, hard to pack, excess salt.
Absher----------	Severe: percs slowly.	Moderate: slope.	Severe: excess salt.	Slight----------	Poor: hard to pack.
4. Aeric fluvaquents					
5---------- Alona	Severe: percs slowly.	Moderate: slope.	Severe: excess salt.	Slight----------	Good.
6---------- Alona	Severe: percs slowly.	Severe: flooding.	Severe: excess salt.	Moderate: flooding.	Good.
7. Badland					
8---------- Banks	Severe: poor filter.	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
9---------- Barkof	Severe: depth to rock, percs slowly.	Severe: seepage.	Severe: seepage, too clayey.	Severe: seepage.	Poor: area reclaim, too clayey, hard to pack.
10---------- Bascovy	Severe: depth to rock, percs slowly.	Severe: seepage.	Slight----------	Slight----------	Poor: area reclaim, hard to pack.
11*: Bascovy----------	Severe: slippage, depth to rock.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage.	Poor: area reclaim, hard to pack, slope.
Sunburst----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
12---------- Benz	Severe: percs slowly.	Moderate: slope.	Severe: excess salt.	Slight----------	Good.
13---------- Bowbells	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
14, 15---------- Bryant	Slight----------	Moderate: slope, seepage.	Slight----------	Slight----------	Good.

See footnote at end of table.

TABLE 8.--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
16*:					
Bryant	Slight	Moderate: slope, seepage.	Slight	Slight	Good.
Cambert	Severe: percs slowly, slope.	Moderate: seepage, slope.	Slight	Slight	Poor: area reclaim.
17 Bryant Variant	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
18 Busby	Slight	Severe: seepage.	Slight	Slight	Good.
19 Busby	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
20*:					
Busby	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Fleak	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope.	Poor: area reclaim, too sandy, slope.
21*:					
Busby	Slight	Severe: seepage.	Slight	Slight	Good.
Twilight	Slight	Severe: seepage.	Slight	Slight	Poor: area reclaim.
22*:					
Busby	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Twilight	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Fleak	Moderate: slope.	Severe: seepage, slope.	Severe: too sandy.	Moderate: slope.	Poor: area reclaim, too sandy.
23*:					
Busby	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Yamac	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Fleak	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope.	Poor: area reclaim, too sandy, slope.

See footnote at end of table.

TABLE 8.--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
24*:					
Busby	Slight	Severe: seepage.	Slight	Slight	Good.
Yetull	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Slight	Poor: seepage, too sandy.
25	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Cabba					
26*:					
Cabba	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Badland.					
27*:					
Cabba	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Barkof	Severe: slippage, depth to rock, slope.	Severe: slippage, seepage, slope.	Severe: slippage, seepage, slope.	Severe: slippage, seepage, slope.	Poor: area reclaim, too clayey, hard to pack.
28*:					
Cabba	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Brandenburg	Severe: poor filter, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
29*:					
Cabba	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Dast	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: area reclaim, slope.
30*:					
Cabba	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Wabek	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: too sandy, seepage, small stones.
Dast	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: area reclaim, slope.

See footnote at end of table.

TABLE 8.--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
31---------- Cabbart	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
32*: Cabbart----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Badland.					
33*: Cabbart----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Kirby----------	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Poor: seepage, small stones, slope.
34*: Cabbart----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Twilight----------	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
35*: Cabbart----------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Yawdim----------	Severe: depth to rock, slippage, percs slowly.	Severe: slippage, seepage, slope.	Severe: slippage.	Severe: slippage.	Poor: area reclaim, hard to pack.
36*: Cabbart----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
Yawdim----------	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
37---------- Cambert	Severe: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Poor: area reclaim.
38*: Cambert----------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.

See footnote at end of table.

TABLE 8.--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
38*:					
Barkof	Severe: slippage, depth to rock, percs slowly.	Severe: slippage, seepage, slope.	Severe: slippage, seepage, too clayey.	Severe: slippage, seepage.	Poor: area reclaim, too clayey, hard to pack.
Cabba	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
39*:					
Cambert	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Cabba	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
40*:					
Cambert	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Dast	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: area reclaim.
Cabba	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
41 Cambeth	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Poor: area reclaim.
42*:					
Cambeth	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Cabbart	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
43*:					
Cambeth	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Twilight	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Cabbart	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
44 Cherry	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 8.--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
45*:					
Cherry	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Havrelon	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Trembles	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Good.
46, 47--- Chinook	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
48--- Chinook	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
49--- Chinook	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
50--- Creed	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Poor: hard to pack.
51*:					
Creed	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Poor: hard to pack:
Gerdrum	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Poor: hard to pack.
52--- Dast	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: area reclaim.
53--- Dast	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: area reclaim.
54*:					
Dast	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: area reclaim.
Blanchard	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
55*:					
Dast	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: area reclaim, slope.
Blanchard	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: too sandy, slope.
56, 57--- Dimmick	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
58, 59--- Ethridge	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
60--- Evanston	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 8.--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
61---------- Evanston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
62*:					
Evanston----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Gerdrum----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Poor: hard to pack.
63---------- Farland	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
64---------- Farnuf	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, small stones.
65, 66---------- Floweree	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
67*:					
Floweree----------	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Cambeth----------	Severe: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Poor: area reclaim.
68---------- Gerdrum	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Poor: hard to pack.
69---------- Gerdrum	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: hard to pack.
70*:					
Gerdrum----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Poor: hard to pack.
Absher----------	Severe: percs slowly.	Moderate: slope.	Severe: excess salt.	Slight----------	Poor: hard to pack.
71*:					
Gerdrum----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Poor: hard to pack.
Yawdim----------	Severe: depth to rock, percs slowly.	Severe: seepage.	Slight----------	Slight----------	Poor: area reclaim, hard to pack.
Fleak----------	Slight----------	Severe: seepage.	Severe: too sandy.	Slight----------	Poor: area reclaim, too sandy.
72*:					
Gerdrum----------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: hard to pack.
Yawdim----------	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.

See footnote at end of table.

TABLE 8.--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
72*: Fleak	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope.	Poor: area reclaim, too sandy, slope.
73, 74--- Glendive	Moderate: flooding.	Severe: seepage, flooding.	Moderate: flooding, too sandy.	Moderate: flooding.	Fair: too sandy.
75--- Glendive	Slight	Severe: seepage.	Moderate: too sandy.	Slight	Fair: too sandy.
76--- Glendive	Moderate: flooding.	Severe: seepage, flooding.	Moderate: flooding, too sandy.	Moderate: flooding.	Fair: too sandy.
77--- Glendive	Slight	Severe: seepage.	Moderate: too sandy.	Slight	Fair: too sandy.
78*: Glendive	Slight	Severe: seepage.	Moderate: too sandy.	Slight	Fair: too sandy.
Hanly	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Slight	Poor: seepage, too sandy.
79--- Hanly	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, too sandy.	Severe: flooding.	Poor: seepage, too sandy.
80--- Harlem	Severe: percs slowly.	Severe: flooding.	Moderate: flooding.	Moderate: flooding.	Poor: hard to pack.
81--- Harlem	Severe: percs slowly.	Slight	Slight	Slight	Poor: hard to pack.
82--- Havre	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding.	Moderate: flooding.	Good:
83--- Havre	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
84--- Havre	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding.	Moderate: flooding.	Good.
85--- Havre	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
86--- Havrelon	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
87--- Havrelon	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
88--- Havrelon	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
89--- Havrelon	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
90--- Havrelon	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 8.--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
91---------- Hillon	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
92---------- Hillon	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
93---------- Hillon	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
94*: Hillon----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Badland.					
95*: Hillon----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Yamac----------	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Fleak----------	Severe: slope.	Severe: seepage, slope.	Severe: slope, too sandy.	Severe: slope,	Poor: area reclaim, too sandy, slope.
96---------- Hoffmanville	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
97, 98---------- Kremlin	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
99---------- Lehr	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
100---------- Lisk	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
101---------- Lisk	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope.
102---------- Lohler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack
103---------- Lohler	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too claye hard t[illegible]ck.
104---------- Lohler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	[illegible]oo clayey, hard to pack.
105---------- Lonna	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.

See footnote at end of table.

TABLE 8.--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
106*:					
Lonna	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
Havre	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
Glendive	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding.	Severe: flooding.	Fair: too sandy.
107, 108 Macar	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
109 Macar	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
110 Macar	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
111*:					
Macar	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Cabba	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
112*:					
Macar	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Cambert	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Poor: area reclaim.
113 Marias	Severe: percs slowly.	Slight	Slight	Slight	Poor: hard to pack.
114 Marvan	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Poor: hard to pack.
115*:					
Neldore	Severe: slippage, depth to rock, slope.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
Badland.					
Bascovy	Severe: slippage, depth to rock.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage.	Poor: area reclaim, hard to pack, slope.
116*:					
Neldore	Severe: slippage, depth to rock, percs slowly.	Severe: slippage, seepage, slope.	Severe: slippage.	Severe: slippage.	Poor: area reclaim, hard to pack.
Bascovy	Severe: depth to rock, percs slowly.	Severe: seepage.	Slight	Slight	Poor: area reclaim, hard to pack.

See footnote at end of table.

TABLE 8.--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
117*:					
Neldore	Severe: slippage, depth to rock, slope.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
Yamac	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Badland.					
118 Pendroy	Severe: percs slowly.	Slight	Slight	Slight	Poor: hard to pack.
119 Ridgelawn	Severe: poor filter.	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
120, 121 Rominell	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
122*:					
Rominell	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Yamac	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
123 Savage	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
124, 125 Shambo	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
126*:					
Shambo	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Cabba	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
127*:					
Shambo	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Cambert	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Poor: area reclaim.
128 Sunburst	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
129 Sunburst	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
130 Sunburst	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
131, 132 Tally	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.

See footnote at end of table.

TABLE 8.--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
133---------- Telstad	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
134*: Telstad----------	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Hillon----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
135*: Telstad----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Hillon----------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
136*: Telstad----------	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Thoeny----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
137---------- Thoeny	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
138*: Thoeny----------	Severe: percs slowly.	Moderate: slope.	Slight----------	Slight----------	Good.
Absher----------	Severe: percs slowly.	Moderate: slope.	Severe: excess salt.	Slight----------	Poor: hard to pack.
139---------- Trembles	Moderate: flooding.	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
140---------- Trembles	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
141---------- Turner	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
142*: Twilight----------	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Yetull----------	Severe: poor filter.	Severe: seepage, slope.	Severe: too sandy.	Moderate: slope.	Poor: seepage, too sandy.
143, 144. Typic Fluvaquents					
145. Typic Ustifluvents					
146*: Typic Ustorthents.					
Typic Ustifluvents.					
147*: Ustic Torriorthents.					

See footnote at end of table.

TABLE 8.--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
147*: Ustic Torrifluvents.					
148---- Vanda	Severe: percs slowly.	Moderate: slope.	Slight----	Slight----	Poor: hard to pack.
149---- Vida	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----	Fair: too clayey.
150---- Vida	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
151*: Vida----	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
Zahill----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
152*: Vida----	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Zahill----	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
153---- Wabek	Severe: poor filter.	Severe: seepage, slope.	Severe: too sandy, seepage.	Severe: seepage.	Poor: too sandy, seepage, small stones.
154---- Wabek	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: too sandy, seepage, small stones.
155---- Weingart	Severe: depth to rock, percs slowly.	Severe: seepage.	Slight----	Slight----	Poor: area reclaim, hard to pack.
156---- Williams	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----	Fair: too clayey.
157---- Williams	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
158*: Williams----	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
Vida----	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
159, 160---- Yamac	Moderate: percs slowly.	Severe: seepage.	Slight----	Slight----	Good.
161---- Yamac	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: slope.

See footnote at end of table.

TABLE 8.--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
162*:					
Yamac	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
Twilight	Slight	Severe: seepage.	Slight	Slight	Poor: area reclaim.
163*:					
Yamac	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Twilight	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
Fleak	Moderate: slope.	Severe: seepage, slope.	Severe: too sandy.	Moderate: slope.	Poor: area reclaim, too sandy.
164 Yawdim	Severe: depth to rock, percs slowly.	Severe: seepage.	Slight	Slight	Poor: area reclaim, hard to pack.
165*:					
Yawdim	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
Badland.					
Cabbart	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
166*:					
Yawdim	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
Badland.					
Gerdrum	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: hard to pack.
167*:					
Yawdim	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.
Kirby	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Poor: seepage, small stones, slope.
168 Zahill	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
169 Zahill	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.

See footnote at end of table.

TABLE 8.--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
170--------------- Zahill	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
171*: Zahill----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Badland.					
172*: Zahill----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Cabba----------	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: area reclaim.
173*: Zahill----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Cabba----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: area reclaim, slope.
174*: Zahill----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Yawdim----------	Severe: depth to rock, slippage, percs slowly.	Severe: slippage, seepage, slope.	Severe: slippage.	Severe: slippage.	Poor: area reclaim, hard to pack.
175*: Zahill----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Yawdim----------	Severe: depth to rock, slope, slippage.	Severe: slippage, seepage, slope.	Severe: slippage, slope.	Severe: slippage, slope.	Poor: area reclaim, hard to pack, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1---------- Absher	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
2---------- Adger	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
3*: Adger----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
Absher----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
4. Aeric Fluvaquents				
5, 6---------- Alona	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
7. Badland				
8---------- Banks	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
9---------- Barkof	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
10---------- Bascovy	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
11*: Bascovy----------	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Sunburst----------	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
12---------- Benz	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
13---------- Bowbells	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
14, 15---------- Bryant	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
16*: Bryant----------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
16*:				
Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
17---------- Bryant Variant	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
18---------- Busby	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
19---------- Busby	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
20*:				
Busby	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Fleak	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
21*:				
Busby	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Twilight	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
22*:				
Busby	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Twilight	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Fleak	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
23*:				
Busby	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Yamac	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Fleak	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
24*:				
Busby	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Yetull	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy.
25---------- Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
26*:				
Cabba	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
Badland.				
27*:				
Cabba	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
Barkof	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
28*:				
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
Brandenburg	Poor: large stones, slope.	Improbable: small stones, large stones.	Improbable: large stones.	Poor: small stones, area reclaim, slope.
29*:				
Cabba	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
Dast	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
30*:				
Cabba	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
Wabek	Fair: slope.	Probable	Probable	Poor: small stones, slope, area reclaim.
Dast	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
31	Poor:	Improbable:	Improbable:	Poor:
Cabbart	area reclaim.	excess fines.	excess fines.	area reclaim, slope.
32*:				
Cabbart	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Badland.				

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
33*:				
Cabbart	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Kirby	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, slope.
34*:				
Cabbart	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Twilight	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
35*:				
Cabbart	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Yawdim	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
36*:				
Cabbart	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Yawdim	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
37 Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
38*:				
Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Barkof	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
39*:				
Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
40*:				
Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Dast	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
41 Cambeth	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
42*:				
Cambeth	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
Cabbart	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
43*:				
Cambeth	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, slope.
Twilight	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Cabbart	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
44 Cherry	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
45*:				
Cherry	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Havrelon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Trembles	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
46, 47 Chinook	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
48 Chinook	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
49 Chinook	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
50 Creed	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
51*:				
Creed	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess fines.
Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
52 Dast	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
53 Dast	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
54*:				
Dast	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
Blanchard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
55*:				
Dast	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Blanchard	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
56, 57 Dimmick	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
58, 59 Ethridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
60, 61 Evanston	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones.
62*:				
Evanston	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones.
Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
63 Farland	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
64 Farnuf	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
65, 66 Floweree	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
67*:				
Floweree	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
67*: Cambeth	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
68, 69: Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
70*: Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Absher	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
71*: Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Yawdim	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
Fleak	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
72*: Gerdrum	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Yawdim	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Fleak	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
73, 74, 75, 76: Glendive	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
77: Glendive	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
78*: Glendive	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Hanly	Good	Probable	Improbable: too sandy.	Poor: thin layer.
79: Hanly	Good	Probable	Improbable: too sandy.	Poor: thin layer.
80, 81: Harlem	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
82, 83: Havre	Good	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
84, 85---------- Havre	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
86, 87---------- Havrelon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
88---------- Havrelon	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
89, 90---------- Havrelon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
91---------- Hillon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
92---------- Hillon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
93---------- Hillon	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
94*: Hillon----------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Badland.				
95*: Hillon----------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Yamac----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Fleak----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
96---------- Hoffmanville	Good----------	Probable----------	Probable----------	Poor: too clayey.
97, 98---------- Kremlin	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
99---------- Lehr	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
100---------- Lisk	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
101---------- Lisk	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
102,103, 104---------- Lohler	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
105---------- Lonna	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
106*: Lonna----------	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Havre----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Glendive----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
107, 108---------- Macar	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
109---------- Macar	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
110---------- Macar	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
111*: Macar----------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Cabba----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
112*: Macar----------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Cambert----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
113---------- Marias	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
114---------- Marvan	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
115*: Neldore----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Badland.				
Bascovy----------	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
116*: Neldore----------	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
116*:				
Bascovy	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
117*:				
Neldore	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Yamac	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Badland.				
118--- Pendroy	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
119--- Ridgelawn	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
120, 121--- Rominell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
122*:				
Rominell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Yamac	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
123--- Savage	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
124, 125--- Shambo	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
126*:				
Shambo	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
127*:				
Shambo	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Cambert	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
128--- Sunburst	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
129--- Sunburst	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
130---------- Sunburst	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
131, 132---------- Tally	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
133---------- Telstad	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
134*: Telstad----------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Hillon----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
135*: Telstad----------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Hillon----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
136*: Telstad----------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Thoeny----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
137---------- Thoeny	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
138*: Thoeny----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
Absher----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
139, 140---------- Trembles	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
141---------- Turner	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
142*:				
Twilight	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Yetull	Good	Probable	Improbable: too sandy.	Fair: too sandy.
143, 144. Typic Fluvaquents				
145. Typic Ustifluvents				
146*: Typic Ustorthents.				
Typic Ustifluvents.				
147*: Ustic Torriorthents.				
Ustic Torrifluvents.				
148 Vanda	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt.
149, 150 Vida	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
151*:				
Vida	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones.
152*:				
Vida	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones, slope.
153 Wabek	Good	Probable	Probable	Poor: small stones, area reclaim.
154 Wabek	Poor: slope.	Probable	Probable	Poor: small stones, slope, area reclaim.
155 Weingart	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
156, 157---------- Williams	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones.
158*: Williams----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones.
Vida----------	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
159, 160---------- Yamac	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
161---------- Yamac	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
162*: Yamac----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Twilight----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
163*: Yamac----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
Twilight----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
Fleak----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
164---------- Yawdim	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
165*: Yawdim----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Badland.				
Cabbart----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
166*: Yawdim----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Badland.				
Gerdrum----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.

See footnote at end of table.

TABLE 9.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
167*:				
Yawdim	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.
Kirby	Fair: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, slope.
168				
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones.
169				
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones, slope.
170				
Zahill	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
171*:				
Zahill	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Badland.				
172*:				
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones, slope.
Cabba	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
173*:				
Zahill	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cabba	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
174*:				
Zahill	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, large stones, slope.
Yawdim	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
175*:				
Zahill	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Yawdim	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1---------- Absher	Severe: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
2---------- Adger	Moderate: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
3*:						
Adger----------	Moderate: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
Absher----------	Moderate: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
4. Aeric Fluvaquents						
5---------- Alona	Moderate: slope.	Severe: piping, excess salt.	Deep to water	Slope, erodes easily, excess salt.	Erodes easily.	Erodes easily.
6---------- Alona	Slight---------	Severe: piping, excess salt.	Deep to water	Erodes easily, excess salt.	Erodes easily.	Excess salt, erodes easily.
7. Badland						
8---------- Banks	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
9---------- Barkof	Severe: seepage.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, percs slowly.	Depth to rock, percs slowly.
10---------- Bascovy	Severe: seepage.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
11*:						
Bascovy----------	Severe: slippage, seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Sunburst---------	Severe: slope.	Slight---------	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
12---------- Benz	Moderate: slope.	Severe: excess salt.	Deep to water	Droughty, percs slowly, slope.	Erodes easily, percs slowly.	Excess salt, erodes easily.
13---------- Bowbells	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Erodes easily.	Erodes easily.
14---------- Bryant	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Erodes easily.	Erodes easily.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
15---------- Bryant	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Erodes easily.	Erodes easily.
16*:						
Bryant----------	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Erodes easily.	Erodes easily.
Cambert----------	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
17---------- Bryant Variant	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, excess salt.	Erodes easily.	Excess salt, erodes easily.
18---------- Busby	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Erodes easily, soil blowing.	Erodes easily.
19---------- Busby	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
20*:						
Busby----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
Fleak----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
21*:						
Busby----------	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Erodes easily, soil blowing.	Erodes easily.
Twilight----------	Severe: seepage.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Depth to rock, soil blowing.	Droughty, depth to rock.
22*:						
Busby----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
Twilight----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Fleak----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
23*:						
Busby----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
Yamac----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Fleak----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
24*:						
Busby----------	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Erodes easily, soil blowing.	Erodes easily.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
24*:						
Yetull	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
25						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
26*:						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Badland.						
27*:						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Barkof	Severe: slippage, seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
28*:						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Brandenburg	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
29*:						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Dast	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, depth to rock. slope.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
30*:						
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Wabek	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing, slope.	Too sandy, soil blowing, slope.	Slope, droughty.
Dast	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, depth to rock, slope.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
31						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
32*:						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Badland.						

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
33*:						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Kirby	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
34*:						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Twilight	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
35*, 36*:						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Yawdim	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
37 Cambert	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily,	Depth to rock, erodes easily.	Erodes easily, depth to rock.
38*:						
Cambert	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily,	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Barkof	Severe: slippage, seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
39*:						
Cambert	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily,	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
40*:						
Cambert	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily,	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Dast	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, depth to rock, slope.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
41---------- Cambeth	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
42*:						
Cambeth----------	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Cabbart----------	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
43*:						
Cambeth----------	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Twilight---------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Cabbart----------	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
44---------- Cherry	Slight---------	Moderate: piping, hard to pack.	Deep to water	Favorable------	Erodes easily.	Erodes easily.
45*:						
Cherry----------	Slight---------	Moderate: piping, hard to pack.	Deep to water	Favorable------	Erodes easily.	Erodes easily.
Havrelon---------	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
Trembles---------	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, flooding.	Soil blowing.	Favorable.
46---------- Chinook	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing.	Soil blowing.	Favorable.
47---------- Chinook	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing.	Favorable.
48---------- Chinook	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing.	Slope.
49---------- Chinook	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing.	Favorable.
50---------- Creed	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
51*:						
Creed----------	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
Gerdrum----------	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
52---------- Dast	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, depth to rock, slope.	Depth to rock, soil blowing.	Depth to rock.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
53---- Dast	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, depth to rock. slope.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
54*: Dast----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, depth to rock, slope.	Depth to rock, soil blowing.	Depth to rock.
Blanchard----	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
55*: Dast----	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, depth to rock, slope.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
Blanchard----	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
56, 57---- Dimmick	Slight----	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
58---- Ethridge	Slight----	Moderate: piping.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
59---- Ethridge	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
60---- Evanston	Moderate: seepage.	Moderate: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
61---- Evanston	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
62*: Evanston----	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
Gerdrum----	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
63---- Farland	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
64---- Farnuf	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
65---- Floweree	Slight----	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
66---- Floweree	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
67*: Floweree----	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
Cambeth----	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
68---------- Gerdrum	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
69---------- Gerdrum	Severe: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Slope, erodes easily, percs slowly.	Excess sodium, slope, erodes easily,
70*: Gerdrum----------	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
Absher----------	Moderate: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
71*: Gerdrum----------	Slight---------	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
Yawdim----------	Severe: seepage.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, percs slowly.	Depth to rock, percs slowly.
Fleak----------	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Depth to rock, too sandy.	Droughty, depth to rock.
72*: Gerdrum----------	Severe: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Slope, erodes easily, percs slowly.	Excess sodium, slope, erodes easily.
Yawdim----------	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Fleak----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
73---------- Glendive	Severe: seepage.	Severe: piping.	Deep to water	Favorable------	Soil blowing.	Favorable.
74, 75, 76, 77---- Glendive	Severe: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
78*: Glendive---------	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing.	Soil blowing.	Favorable.
Hanly----------	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
79---------- Hanly	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
80, 81---------- Harlem	Slight---------	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
82, 83---------- Havre	Moderate: seepage.	Severe: piping.	Deep to water	Excess salt----	Erodes easily.	Erodes easily.
84, 85---------- Havre	Moderate: seepage.	Severe: piping.	Deep to water	Excess salt----	Favorable------	Favorable.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
86, 87---------- Havrelon	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
88---------- Havrelon	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding, excess salt.	Erodes easily.	Erodes easily.
89, 90---------- Havrelon	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
91---------- Hillon	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
92, 93---------- Hillon	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
94*: Hillon----------	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Badland.						
95*: Hillon----------	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Yamac----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Fleak----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
96---------- Hoffmanville	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slow intake, percs slowly.	Too sandy------	Percs slowly.
97---------- Kremlin	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
98---------- Kremlin	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
99---------- Lehr	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Too sandy------	Droughty.
100---------- Lisk	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing.	Favorable.
101---------- Lisk	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing.	Slope.
102---------- Lohler	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly.	Percs slowly.	Percs slowly.
103, 104---------- Lohler	Slight---------	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly.	Percs slowly.
105---------- Lonna	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Erodes easily.	Erodes easily.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
106*:						
Lonna	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Erodes easily.	Erodes easily.
Havre	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily.	Erodes easily.
Glendive	Severe: seepage.	Severe: piping.	Deep to water	Flooding, soil blowing.	Soil blowing.	Favorable.
107--- Macar	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
108--- Macar	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
109--- Macar	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
110--- Macar	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, excess salt.	Erodes easily.	Erodes easily.
111*:						
Macar	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
112*:						
Macar	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
Cambert	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
113--- Marias	Slight	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
114--- Marvan	Moderate: slope.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Erodes easily, percs slowly.	Excess salt, erodes easily, percs slowly.
115*:						
Neldore	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Badland.						
Bascovy	Severe: slippage, seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
116*:						
Neldore	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
116*: Bascovy	Severe: seepage.	Severe: hard to pack, thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
117*: Neldore	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Yamac	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Badland.						
118--- Pendroy	Slight	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
119--- Ridgelawn	Severe: seepage.	Severe: seepage, piping.	Deep to water	Erodes easily.	Erodes easily, too sandy.	Erodes easily.
120, 121--- Rominell	Moderate: seepage, slope.	Severe: piping, excess sodium.	Deep to water	Percs slowly, slope, excess sodium.	Erodes easily.	Excess sodium, erodes easily, percs slowly.
122*: Rominell	Moderate: seepage, slope.	Severe: piping, excess sodium.	Deep to water	Percs slowly, slope, excess sodium.	Erodes easily.	Excess sodium, erodes easily, percs slowly.
Yamac	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
123--- Savage	Slight	Moderate: piping.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
124--- Shambo	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable	Favorable.
125--- Shambo	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
126*: Shambo	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
127*: Shambo	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
Cambert	Moderate: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
128--- Sunburst	Moderate: slope.	Slight	Deep to water	Percs slowly, slope.	Percs slowly.	Percs slowly.
129, 130--- Sunburst	Severe: slope.	Slight	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
131---------- Tally	Severe: seepage.	Severe: seepage, piping.	Deep to water	Soil blowing.	Soil blowing.	Favorable.
132---------- Tally	Severe: seepage.	Severe: seepage, piping.	Deep to water	Soil blowing, slope.	Soil blowing.	Favorable.
133---------- Telstad	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
134*:						
Telstad----------	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Hillon----------	Moderate: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
135*:						
Telstad----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Hillon----------	Severe: slope.	Moderate: piping.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
136*:						
Telstad----------	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Thoeny----------	Moderate: slope.	Severe: excess sodium.	Deep to water	Percs slowly, slope, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, percs slowly.
137---------- Thoeny	Moderate: slope.	Severe: excess sodium.	Deep to water	Percs slowly, slope, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, percs slowly.
138*:						
Thoeny----------	Moderate: slope.	Severe: excess sodium.	Deep to water	Percs slowly, slope, excess sodium.	Erodes easily, percs slowly.	Excess sodium, erodes easily, percs slowly.
Absher----------	Moderate: slope.	Severe: excess sodium, excess salt.	Deep to water	Droughty, percs slowly.	Erodes easily, percs slowly.	Excess salt, excess sodium, erodes easily.
139, 140---------- Trembles	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing.	Too sandy, soil blowing.	Favorable.
141---------- Turner	Severe: seepage.	Severe: seepage.	Deep to water	Droughty-------	Large stones, erodes easily.	Erodes easily, droughty.
142*:						
Twilight----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Yetull----------	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
143, 144. Typic Fluvaquents						
145. Typic Ustifluvents						
146*: Typic Ustorthents.						
Typic Ustifluvents.						
147*: Ustic Torriorthents.						
Ustic Torrifluvents.						
148---------- Vanda	Moderate: slope.	Severe: hard to pack.	Deep to water	Droughty, slow intake, percs slowly.	Erodes easily, percs slowly.	Excess salt, erodes easily.
149---------- Vida	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
150---------- Vida	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
151*: Vida----------	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Zahill----------	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
152*: Vida----------	Severe: slope.	Moderate: piping.	Deep to water	Slope----------	Slope----------	Slope.
Zahill----------	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
153, 154---------- Wabek	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing, slope.	Too sandy, soil blowing, slope.	Slope, droughty.
155---------- Weingart	Severe: seepage.	Severe: excess sodium.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, erodes easily.	Excess sodium, erodes easily, depth to rock.
156---------- Williams	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Erodes easily.	Erodes easily.
157---------- Williams	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope.	Erodes easily.	Erodes easily.
158*: Williams----------	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope.	Erodes easily.	Erodes easily.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
158*: Vida	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Favorable	Favorable.
159 Yamac	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily.	Erodes easily.	Erodes easily.
160 Yamac	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
161 Yamac	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
162*: Yamac	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
Twilight	Severe: seepage.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Depth to rock, soil blowing.	Droughty, depth to rock.
163*: Yamac	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Twilight	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Fleak	Severe: seepage, slope.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
164 Yawdim	Severe: slippage, seepage.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, percs slowly.	Depth to rock, percs slowly.
165*: Yawdim	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Badland.						
Cabbart	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
166*: Yawdim	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock. percs slowly.
Badland.						
Gerdrum	Severe: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, excess sodium.	Slope, erodes easily, percs slowly.	Excess sodium, slope, erodes easily.

See footnote at end of table.

TABLE 10.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
167*:						
Yawdim	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Kirby	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
168 Zahill	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.	Erodes easily.
169, 170 Zahill	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
171*:						
Zahill	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Badland.						
172*, 173*:						
Zahill	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Cabba	Severe: slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
174*, 175*:						
Zahill	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Yawdim	Severe: slippage, seepage, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1---------- Absher	0-7	Clay loam--------	CL	A-6	0	95-100	75-100	70-100	60-90	25-40	10-20
	7-11	Silty clay, clay, clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-60	20-40
	11-60	Clay loam, clay, sandy clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-55	20-35
2---------- Adger	0-7	Silty clay loam	CL	A-6, A-7	0-10	90-100	85-100	75-100	65-90	30-45	10-20
	7-16	Clay loam, silty clay loam, clay.	CL, CH	A-6, A-7	0-10	90-100	85-100	75-100	65-95	35-60	15-40
	16-60	Silty clay loam, gravelly clay loam, silt loam.	CL, CH	A-6, A-7	0-10	80-100	70-100	65-100	55-90	35-60	15-40
3*:											
Adger----------	0-7	Silty clay loam	CL	A-6, A-7	0-10	90-100	85-100	75-100	65-90	30-45	10-20
	7-16	Clay loam, silty clay loam, clay.	CL, CH	A-6, A-7	0-10	90-100	85-100	75-100	65-95	35-60	15-40
	16-60	Silty clay loam, gravelly clay loam, silt loam.	CL, CH	A-6, A-7	0-10	80-100	70-100	65-100	55-90	35-60	15-40
Absher----------	0-7	Clay loam--------	CL	A-6	0	95-100	75-100	70-100	60-90	25-40	10-20
	7-11	Silty clay, clay, clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-60	20-40
	11-60	Clay loam, clay, sandy clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-55	20-35
4. Aeric Fluvaquents											
5---------- Alona	0-5	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	25-35	5-10
	5-13	Silty clay loam, silt loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-40	5-15
	13-22	Silty clay loam, silt loam.	CL-ML, SIL	A-4, A-6	---	100	100	95-100	80-95	25-40	5-15
	22-60	Silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-15
6---------- Alona	0-5	Silt loam--------	CL-ML, ML	A-4	0	100	100	95-100	60-90	25-35	5-10
	5-22	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	25-40	5-15
	22-60	Silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-15
7. Badland											
8---------- Banks	0-16	Fine sandy loam	ML, SM	A-4	0	100	100	75-90	45-75	20-25	NP-5
	16-60	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2	0	100	100	50-70	10-25	---	NP
9---------- Barkof	0-7	Silty clay--------	CL, CH	A-7	0	100	100	90-100	85-95	45-60	20-30
	7-29	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-90	45-65	25-45
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
10---------- Bascovy	0-2	Silty clay--------	CH, CL	A-7	0	90-100	75-100	70-95	60-95	40-60	20-35
	2-11	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	11-23	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
11*:											
Bascovy	0-2	Silty clay	CH, CL	A-7	0	90-100	75-100	70-95	60-95	40-60	20-35
	2-11	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	11-23	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Sunburst	0-3	Clay loam	CL	A-6, A-7	0-10	95-100	85-95	85-95	75-85	35-45	15-20
	3-19	Clay, clay loam, silty clay loam.	CL	A-7	0-10	95-100	85-95	85-95	85-95	40-50	20-30
	19-60	Clay, clay loam, silty clay.	CL	A-7	0-10	95-100	85-95	85-95	85-95	40-50	20-30
12	0-7	Clay loam	CL	A-6	0	100	100	90-100	70-90	30-40	10-15
Benz	7-60	Stratified clay loam to sandy loam.	CL	A-6	0	100	100	90-95	65-80	30-40	10-20
13	0-10	Loam	CL, CL-ML	A-4, A-6	0-5	95-100	90-100	85-95	60-90	20-40	5-20
Bowbells	10-28	Loam, clay loam	CL	A-6, A-7	0-5	95-100	90-100	80-95	60-80	20-45	10-25
	28-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	90-100	80-95	60-80	20-45	10-25
14, 15	0-4	Silt loam	ML, CL, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
Bryant	4-14	Clay loam, silt loam, silty clay loam.	CL, ML, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
	14-60	Silty clay loam, loam, silt loam.	CL, ML, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
16*:											
Bryant	0-4	Silt loam	ML, CL, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
	4-14	Clay loam, silt loam, silty clay loam.	CL, ML, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
	14-60	Silty clay loam, loam, silt loam.	CL, ML, CL-ML	A-6, A-4	0	100	100	85-100	70-100	25-40	3-15
Cambert	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
17	0-10	Silt loam	CL-ML	A-4	0	100	100	95-100	70-90	25-30	5-10
Bryant Variant	10-42	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	42-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-40	5-15
18, 19	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
Busby	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
20*:											
Busby	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
20*:											
Fleak	0-7	Loamy sand	SM	A-2, A-4	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
21*:											
Busby	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
22*:											
Busby	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Fleak	0-7	Loamy sand	SM	A-4, A-2	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
23*:											
Busby	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
Fleak	0-7	Loamy sand	SM	A-4, A-2	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
24*:											
Busby	0-5	Fine sandy loam	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
	5-11	Fine sandy loam, sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	60-90	35-75	20-30	NP-10
	11-60	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-85	35-50	20-25	NP-5
Yetull	0-6	Fine sandy loam	SM, ML	A-4	0-10	95-100	95-100	70-90	35-55	---	NP
	6-60	Loamy coarse sand, sand, loamy sand.	SM, SP-SM	A-1, A-3, A-2	0-10	95-100	95-100	45-70	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
25----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
Cabba	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
26*:											
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											
27*:											
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Barkof----------	0-7	Silty clay-------	CL, CH	A-7	0	100	100	90-100	85-95	45-60	20-30
	7-29	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-90	45-65	25-45
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
28*:											
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Brandenburg-----	0-5	Channery loam	CL-ML, GM-GC, CL, SM-SC	A-2, A-4, A-6	0-5	65-85	55-75	45-65	30-55	20-35	5-15
	5-10	Channery loam, very channery loam.	GM-GC	A-2, A-4	0-10	40-70	30-60	25-50	20-45	20-30	5-10
	10-60	Fragmental material.	GP	A-1	80-85	15-25	5-10	0-5	0	---	NP
29*:											
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dast----------	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	80-100	75-100	65-90	30-55	15-25	NP-5
	3-25	Fine sandy loam, sandy loam.	SM, ML	A-4, A-2	0	80-100	75-100	55-85	30-55	15-25	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
30*:											
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
30*											
Wabek	0-7	Sandy loam	SM	A-2, A-4	0-5	85-100	85-100	60-70	30-40	---	NP
	7-60	Very gravelly sand, very gravelly loamy sand.	GM, GP-GM SM, SP_SM	A-1	0-5	40-60	30-50	15-40	5-20	---	NP
Dast	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	80-100	75-100	65-90	30-55	15-25	NP-5
	3-25	Fine sandy loam, sandy loam.	SM, ML	A-4, A-2	0	80-100	75-100	55-85	30-55	15-25	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
31	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
Cabbart	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
32*:											
Cabbart	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											
33*:											
Cabbart	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kirby	0-5	Very channery loam.	GM, GM-GC	A-2, A-1, A-4	0-15	40-60	30-50	25-45	20-40	15-25	NP-10
	5-18	Extremely channery loam, extremely channery sandy loam, very channery loam.	GP-GM, GM, GM-GC	A-2, A-1	10-30	20-60	10-50	5-40	5-35	15-25	NP-10
	18-60	Fragmental material.	GP	A-1	40-60	5-15	0-10	0-5	0	---	NP
34*:											
Cabbart	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
35*, 36*:											
Cabbart	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
35*, 36* Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
37 Cambert	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
38*: Cambert	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Barkof	0-7	Silty clay	CL, CH	A-7	0	100	100	90-100	85-95	45-60	20-30
	7-29	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-90	45-65	25-45
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cabba	0-5	Loam	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
39*: Cambert	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Cabba	0-5	Loam	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
40*: Cambert	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dast	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	80-100	75-100	65-90	30-55	15-25	NP-5
	3-25	Fine sandy loam, sandy loam.	SM, ML	A-4, A-2	0	80-100	75-100	55-85	30-55	15-25	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Cabba	0-5	Loam	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silt loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
41---------- Cambeth	0-6	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	25-35	5-10
	6-11	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	11-35	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
42*: Cambeth---------	0-6	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	25-35	5-10
	6-11	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	11-35	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
42*: Cabbart---------	0-4	Silt loam--------	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
43*: Cambeth---------	0-6	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	25-35	5-10
	6-11	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	11-35	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Twilight--------	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Cabbart---------	0-4	Silt loam--------	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
44---------- Cherry	0-3	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	85-100	60-90	25-35	5-15
	3-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	25-40	10-20
45*: Cherry----------	0-3	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	85-100	60-90	25-35	5-15
	3-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	25-40	10-20
Havrelon--------	0-5	Loam-------------	CL-ML	A-4	0	100	100	85-95	60-75	20-30	5-10
	5-60	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-80	20-35	5-15
Trembles--------	0-6	Fine sandy loam	SM, ML	A-4	0	100	100	75-85	45-55	20-30	NP-5
	6-16	Stratified fine sandy loam to loam.	SM, ML	A-2, A-4	0	100	100	65-85	30-55	20-30	NP-5
	16-60	Stratified fine sandy loam to loamy sand.	SM	A-2, A-4	0	100	100	60-80	25-50	15-25	NP-5

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
46, 47, 48, 49--- Chinook	0-6	Fine sandy loam	SM	A-4	0	100	100	70-85	35-50	15-25	NP-5
	6-29	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	70-85	35-50	15-25	NP-5
	29-60	Fine sandy loam, loamy fine sand, sandy loam.	SM	A-4, A-2	0	100	100	60-80	25-45	15-25	NP-5
50---------- Creed	0-8	Loam----------	CL-ML, SM-SC	A-4	0	90-100	75-100	65-95	45-75	20-30	5-10
	8-24	Silty clay, clay, silty clay loam.	CL, CH	A-6, A-7	0	90-100	75-100	70-100	60-95	35-60	15-35
	24-60	Silty clay loam, clay loam, silty clay.	CL, SC	A-6, A-7	0	90-100	75-100	60-100	35-90	30-50	15-25
51*:											
Creed----------	0-8	Loam----------	CL-ML, SM-SC	A-4	0	90-100	75-100	65-95	45-75	20-30	5-10
	8-24	Silty clay, clay, silty clay loam.	CL, CH	A-6, A-7	0	90-100	75-100	70-100	60-95	35-60	15-35
	24-60	Silty clay loam, clay loam, silty clay.	CL, SC	A-6, A-7	0	90-100	75-100	60-100	35-90	30-50	15-25
Gerdrum---------	0-7	Clay loam--------	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35
52, 53---------- Dast	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	80-100	75-100	65-90	30-55	15-25	NP-5
	3-25	Fine sandy loam, sandy loam.	SM, ML	A-4, A-2	0	80-100	75-100	55-85	30-55	15-25	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
54*, 55*:											
Dast----------	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	80-100	75-100	65-90	30-55	15-25	NP-5
	3-25	Fine sandy loam, sandy loam.	SM, ML	A-4, A-2	0	80-100	75-100	55-85	30-55	15-25	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Blanchard-------	0-7	Loamy sand-------	SM	A-2	0	100	100	50-75	15-30	---	NP
	7-60	Fine sand, loamy sand, loamy fine sand.	SM	A-2	0	100	100	60-85	15-35	---	NP
56---------- Dimmick	0-7	Silty clay-------	CH, CL	A-7	0	100	100	90-100	75-95	40-60	15-35
	7-60	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	45-70	20-45
57---------- Dimmick	0-7	Clay----------	CH, CL	A-7	0	100	100	90-100	75-95	40-60	15-35
	7-60	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	45-70	20-45
58, 59---------- Ethridge	0-3	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-95	25-45	10-20
	3-11	Silty clay, silty clay loam, clay.	CL	A-7	0	100	95-100	95-100	90-95	40-50	20-30
	11-60	Silty clay loam, clay loam, silty clay.	CL	A-6, A-7	0	100	95-100	95-100	85-95	30-50	10-25
60---------- Evanston	0-8	Loam----------	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-90	65-70	25-35	5-15
	8-26	Clay loam, loam, silty clay loam.	CL	A-6	0-5	95-100	95-100	85-100	65-80	25-35	10-15
	26-60	Loam, clay loam, fine sandy loam.	CL	A-6	0-5	95-100	95-100	70-90	50-65	25-35	10-15

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
61---------- Evanston	0-8	Loam----------	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-90	65-70	25-35	5-15
	8-26	Clay loam, loam, silty clay loam.	CL	A-6	0-5	95-100	95-100	85-100	65-80	25-35	10-15
	26-61	Loam, clay loam, fine sandy loam.	CL	A-6	0-5	95-100	95-100	70-90	50-65	25-35	10-15
62*:											
Evanston--------	0-8	Loam----------	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-90	65-70	25-35	5-15
	8-26	Clay loam, loam, silty clay loam.	CL	A-6	0-5	95-100	95-100	85-100	65-80	25-35	10-15
	26-60	Loam, clay loam, fine sandy loam.	CL	A-6	0-5	95-100	95-100	70-90	50-65	25-35	10-15
Gerdrum---------	0-7	Clay loam--------	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35
63---------- Farland	0-4	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	85-100	70-90	20-35	5-15
	4-15	Silty clay loam, clay loam.	CL	A-7, A-6	0	100	100	90-100	75-95	30-45	10-20
	15-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	85-100	70-90	25-40	5-20
64---------- Farnuf	0-6	Loam----------	ML	A-4	0	80-100	75-100	60-100	55-80	20-35	NP-10
	6-15	Clay loam, loam, silty clay loam.	CL	A-6	0	80-100	75-100	65-95	50-90	25-40	10-20
	15-60	Loam, clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	80-100	75-100	65-95	50-80	25-35	5-15
65, 66---------- Floweree	0-6	Silt loam--------	ML	A-4	0	100	100	90-100	70-90	20-35	NP-10
	6-10	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	85-95	25-40	5-15
	10-60	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	85-95	25-40	5-15
67*:											
Floweree--------	0-6	Silt loam--------	ML	A-4	0	100	100	90-100	70-90	20-35	NP-10
	6-10	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	85-95	25-40	5-15
	10-60	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	85-95	25-40	5-15
Cambeth---------	0-6	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	70-90	25-35	5-10
	6-11	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	11-35	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	25-40	5-20
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
68, 69---------- Gerdrum	0-7	Clay loam--------	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35
70*:											
Gerdrum---------	0-7	Clay loam--------	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
70*:											
Absher	0-7	Clay loam	CL	A-6	0	95-100	75-100	70-100	60-90	25-40	10-20
	7-11	Silty clay, clay, clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-60	20-40
	11-60	Clay loam, clay, sandy clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-55	20-35
71*, 72*:											
Gerdrum	0-7	Clay loam	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35
Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Fleak	0-7	Loamy sand	SM	A-4, A-2	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
73--- Glendive	0-6	Sandy loam	SM, ML	A-4, A-2	0	100	100	65-85	30-55	20-35	NP-10
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	95-100	75-100	60-90	25-50	15-25	NP-10
74--- Glendive	0-6	Loam	ML	A-4	0	100	100	75-95	65-90	20-35	NP-10
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	95-100	75-100	60-90	25-50	15-25	NP-10
75--- Glendive	0-6	Loam	ML, CL-ML	A-4	0	100	100	75-95	65-90	20-30	NP-10
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	85-100	75-100	55-85	25-50	15-25	NP-10
76--- Glendive	0-6	Silty clay loam	ML	A-4	0	100	100	75-95	65-90	20-35	NP-10
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	95-100	75-100	60-90	25-50	15-25	NP-10
77--- Glendive	0-6	Silty clay loam	CL	A-6	0	100	100	90-100	80-95	30-40	10-20
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	85-100	75-100	55-85	25-50	15-25	NP-10
78*:											
Glendive	0-6	Sandy loam	SM	A-4, A-2	0	100	100	60-80	30-50	15-25	NP-5
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-4, A-2	0	85-100	75-100	55-85	25-50	15-25	NP-10
Hanly	0-4	Loamy fine sand	SM	A-2	0	100	100	50-75	15-30	---	NP
	4-60	Stratified fine sandy loam to sand.	SM, SP-SM	A-2, A-3	0	100	100	50-85	5-25	---	NP
79--- Hanly	0-4	Loamy fine sand	SM	A-2	0	100	100	50-75	15-30	---	NP
	4-60	Stratified fine sandy loam to sand.	SM, SP-SM	A-2, A-3	0	100	100	50-85	5-25	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
80, 81	0-5	Silty clay	CL, CH	A-7	0	100	100	90-100	75-90	40-65	20-40
Harlem	5-60	Stratified clay to silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-70	15-45
82, 83	0-5	Silt loam	CL-ML	A-4	0	100	100	80-95	60-90	20-30	5-10
Havre	5-60	Stratified fine sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0	100	100	70-95	60-80	20-35	5-15
84, 85	0-9	Silty clay loam	CL	A-6	0	100	100	85-100	75-95	25-40	10-20
Havre	9-60	Stratified fine sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0	100	100	70-95	60-80	20-35	5-15
86, 87	0-5	Loam	CL-ML	A-4	0	100	100	85-100	60-95	20-30	5-10
Havrelon	5-60	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-80	25-40	5-15
88	0-5	Loam	CL-ML	A-4	0	100	100	85-95	60-75	25-30	5-10
Havrelon	5-60	Stratified fine sandy loam to sandy clay loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	100	100	70-95	40-60	25-35	5-15
89, 90	0-6	Silty clay loam	CL-ML	A-4	0	100	100	85-100	60-95	20-30	5-10
Havrelon	6-60	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-80	25-40	5-15
91, 92, 93	0-7	Loam	ML, CL, CL-ML	A-4, A-6	0-5	85-100	80-100	80-90	65-75	20-35	NP-15
Hillon	7-60	Loam, clay loam	CL	A-6	0-5	85-100	80-100	80-90	65-80	25-35	10-20
94*:											
Hillon	0-7	Loam	ML, CL, CL-ML	A-4, A-6	0-5	85-100	80-100	80-90	65-75	20-35	NP-15
	7-60	Loam, clay loam	CL	A-6	0-5	85-100	80-100	80-90	65-80	25-35	10-20
Badland.											
95*:											
Hillon	0-7	Loam	ML, CL, CL-ML	A-4, A-6	0-5	85-100	80-100	80-90	65-75	20-35	NP-15
	7-60	Loam, clay loam	CL	A-6	0-5	85-100	80-100	80-90	65-80	25-35	10-20
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
Fleak	0-7	Loamy sand	SM	A-4, A-2	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
96	0-5	Silty clay	CL, CH	A-7	0	100	100	90-100	85-95	40-55	15-30
Hoffmanville	5-28	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0	100	100	90-100	80-95	35-55	15-35
	28-60	Loamy fine sand, fine sand, gravelly loamy fine sand.	SM, SP-SM	A-1, A-2, A-3	0	65-100	50-100	40-90	5-35	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
97, 98---------- Kremlin	0-6	Loam----------	CL-ML	A-4	0	95-100	90-100	75-95	50-75	25-30	5-10
	6-10	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	0	95-100	90-100	75-95	55-80	25-35	5-15
	10-18	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	0	95-100	90-100	75-95	55-80	25-35	5-15
	18-60	Stratified sandy loam to silt loam.	ML, CL-ML	A-4	0	90-100	85-100	70-90	50-75	20-30	NP-10
99---------- Lehr	0-4	Loam----------	ML, CL-ML	A-4	0	95-100	95-100	85-95	60-80	20-35	5-10
	4-18	Loam, clay loam	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-95	60-75	25-40	5-15
	18-60	Very gravelly fine sand, extremely gravelly loamy sand.	GM, GP-GM	A-1	0-5	35-60	20-50	10-35	5-15	---	NP
100, 101--------- Lisk	0-5	Sandy loam-------	SM	A-4	0	100	100	60-75	35-50	20-30	NP-5
	5-15	Sandy loam, fine sandy loam.	ML, SM	A-4	0	100	100	60-85	35-60	20-30	NP-5
	15-41	Sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0	100	100	55-80	30-55	20-30	NP-5
	41-60	Loamy sand, loamy fine sand.	SM	A-1, A-2	0	100	100	45-80	15-30	---	NP
102---------- Lohler	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-95	25-50	10-30
	6-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	80-95	45-70	25-50
103, 104--------- Lohler	0-5	Silty clay-------	CH, CL	A-7	0	100	100	95-100	80-95	45-70	25-50
	5-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	80-95	45-70	25-50
105---------- Lonna	0-7	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	30-35	10-15
	7-12	Silt loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	95-100	75-95	25-40	5-15
	12-60	Silt loam, silty clay loam.	CL-ML, CL	A-6, A-4	---	100	100	95-100	75-95	25-40	5-15
106*:											
Lonna----------	0-7	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	30-35	10-15
	7-12	Silt loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	95-100	75-95	25-40	5-15
	12-60	Silt loam, silty clay loam.	CL-ML, CL	A-6, A-4	---	100	100	95-100	75-95	25-40	5-15
Havre----------	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	80-95	60-75	20-30	NP-10
	5-60	Stratified fine sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0	100	100	80-95	50-70	20-35	5-15
Glendive--------	0-6	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-4, A-2	0	100	100	65-85	30-55	20-30	NP-10
	6-60	Stratified loamy fine sand to silt loam.	SM, SM-SC	A-2, A-4	0	95-100	75-100	60-80	25-50	15-25	NP-10
107, 108, 109---- Macar	0-3	Loam----------	CL-ML	A-4	0	100	100	75-95	55-70	25-30	5-10
	3-34	Clay loam, loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	75-95	60-85	25-40	5-15
	34-60	Stratified sandy clay loam to silt loam.	CL-ML, CL	A-6, A-4	0	90-100	85-100	70-90	50-75	25-35	5-15

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
110----------	0-7	Loam----------	CL-ML	A-4	0	100	100	75-95	55-70	25-30	5-10
Macar	7-20	Clay loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	75-95	60-85	25-40	5-15
	20-60	Clay loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	75-95	60-85	25-40	5-15
111*:											
Macar----------	0-3	Loam----------	CL-ML	A-4	0	100	100	75-95	55-70	25-30	5-10
	3-34	Clay loam, loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	75-95	60-85	25-40	5-15
	34-60	Stratified sandy clay loam to silt loam.	CL-ML, CL	A-6, A-4	0	90-100	85-100	70-90	50-75	25-35	5-15
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
112*:											
Macar----------	0-3	Loam----------	CL-ML	A-4	0	100	100	75-95	55-70	25-30	5-10
	3-34	Clay loam, loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	75-95	60-85	25-40	5-15
	34-60	Stratified sandy clay loam to silt loam.	CL-ML, CL	A-6, A-4	0	90-100	85-100	70-90	50-75	25-35	5-15
Cambert----------	0-4	Loam----------	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
113----------	0-7	Clay----------	CL, CH	A-7	0	100	100	90-100	75-95	40-70	25-50
Marias	7-33	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-95	40-70	25-50
	33-60	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-95	40-70	25-50
114----------	0-4	Clay----------	CL, CH	A-7	0	100	100	90-100	75-95	40-70	25-50
Marvan	4-35	Clay, silty clay	CL, CH	A-7	0	100	100	90-100	75-100	45-70	25-50
	35-60	Clay, silty clay silty clay loam.	CL, CH	A-7	0	100	100	90-100	75-100	45-70	25-50
115*:											
Neldore----------	0-3	Clay----------	CL, CH	A-7	0-10	95-100	90-100	75-100	70-95	40-55	20-30
	3-16	Clay, silty clay	CL, CH	A-7	0-5	85-100	80-100	65-95	60-90	40-60	20-40
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											
Bascovy----------	0-2	Silty clay-------	CH, CL	A-7	0	90-100	75-100	70-95	60-95	40-60	20-35
	2-11	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	11-23	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Neldore----------	0-3	Clay----------	CL, CH	A-7	0-10	95-100	90-100	75-100	70-95	40-55	20-30
	3-16	Clay, silty clay	CL, CH	A-7	0-5	85-100	80-100	65-95	60-90	40-60	20-40
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
116*											
Bascovy	0-2	Silty clay	CH, CL	A-7	0	90-100	75-100	70-95	60-95	40-60	20-35
	2-11	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	11-23	Clay, silty clay	CH	A-7	0	90-100	75-100	70-95	60-95	50-70	25-45
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
117*:											
Neldore	0-3	Clay	CL, CH	A-7	0-10	95-100	90-100	75-100	70-95	40-55	20-30
	3-16	Clay, silty clay	CL, CH	A-7	0-5	85-100	80-100	65-95	60-90	40-60	20-40
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
Badland.											
118	0-14	Clay	CH	A-7	0	100	100	90-100	75-95	60-85	40-60
Pendroy	14-47	Clay	CH	A-7	0	100	100	90-100	75-95	60-85	40-60
	47-69	Silty clay, clay	CH	A-7	0	100	100	80-95	50-75	30-55	
119	0-7	Silt loam	CL-ML	A-4	0	100	100	85-95	65-80	20-35	5-10
Ridgelawn	7-24	Loam, silt loam, silty clay loam.	CL-ML, CL	A-6, A-4	0	100	100	80-95	60-80	20-35	5-15
	24-60	Fine sand, loamy fine sand, gravelly loamy sand.	SM	A-2, A-1	0	65-100	50-100	30-75	10-35	---	NP
120, 121	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-80	25-30	5-10
Rominell	4-9	Very fine sandy loam, fine sandy loam, loam.	ML, SM, CL-ML, SM-SC	A-4	0	100	100	70-95	40-75	25-35	5-10
	9-25	Clay loam, loam, sandy clay loam.	CL-ML, ML, SM-SC, CL, SC	A-4, A-6	0	100	100	85-90	40-75	25-35	5-15
	25-60	Clay loam, loam, sandy loam.	CL-ML, ML, SM, SM-SC	A-4		0	90-100	60-90	45-70	20-30	NP-10
122*:											
Rominell	0-4	Loam	CL-ML	A-4	0	100	100	85-95	60-80	25-30	5-10
	4-9	Very fine sandy loam, fine sandy loam, loam.	ML, SM, CL-ML, SM-SC	A-4	0	100	100	70-95	40-75	25-35	5-10
	9-25	Clay loam, loam, sandy clay loam.	CL-ML, SM-SC, CL, SC	A-4, A-6	0	100	100	85-90	40-75	25-35	5-15
	25-60	Clay loam, loam, sandy loam.	CL-ML, ML, SM, SM-SC	A-4	0	90-100	85-100	60-90	45-70	20-30	NP-10
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
123	0-7	Silty clay loam	CL, CL-ML	A-6, A-4	0	95-100	95-100	90-100	80-95	25-40	5-15
Savage	7-28	Clay, silty clay, silty clay loam.	CL	A-7, A-6	0	95-100	95-100	85-100	75-95	35-50	15-30
	28-60	Silty clay, silty clay loam, clay.	CL	A-7, A-6	0-5	90-100	85-100	75-100	65-95	30-50	10-30

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
124, 125--------- Shambo	0-4	Loam----------	CL-ML	A-4	0	100	100	85-95	60-75	25-30	5-10
	4-14	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
	14-60	Stratified loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
126*: Shambo----------	0-4	Loam----------	CL-ML	A-4	0	100	100	85-95	60-75	25-30	5-10
	4-14	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
	14-60	Stratified loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
Cabba----------	0-5	Loam----------	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
127*: Shambo----------	0-4	Loam----------	CL-ML	A-4	0	100	100	85-95	60-75	25-30	5-10
	4-14	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
	14-60	Stratified loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-95	60-75	25-40	5-15
Cambert----------	0-4	Loam----------	CL-ML	A-4	0	100	100	85-95	60-70	20-30	5-10
	4-13	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	13-21	Silt loam, silty clay loam, loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
128, 129, 130---- Sunburst	0-3	Clay loam---------	CL	A-6, A-7	0-10	95-100	85-95	85-95	75-85	35-45	15-20
	3-19	Clay, clay loam, silty clay loam.	CL	A-7	0-10	95-100	85-95	85-95	85-95	40-50	20-30
	19-60	Clay, silty clay loam, silty clay.	CL	A-7	0-10	95-100	85-95	85-95	85-95	40-50	20-30
131, 132--------- Tally	0-4	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4, A-2	0	90-100	80-100	60-100	30-55	20-30	NP-10
	4-20	Fine sandy loam, sandy loam.	SM, SM-SC	A-4, A-2	0	90-100	80-100	60-100	25-50	15-25	NP-10
	20-31	Sandy loam, fine sandy loam, loamy fine sand.	SM	A-4, A-2	0	90-100	80-100	60-100	15-50	15-25	NP-5
	31-60	Loamy fine sand, fine sand, sandy loam.	SM	A-2	0	90-100	80-100	60-85	15-35	---	NP
133---------- Telstad	0-4	Loam----------	CL-ML	A-4	0-5	85-100	80-100	65-90	50-70	25-30	5-10
	4-13	Clay loam, loam	CL	A-6	0-5	95-100	90-100	80-95	60-80	30-40	10-20
	13-22	Clay loam, loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	80-95	60-80	25-35	5-15
	22-60	Loam, clay loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	75-90	55-75	25-35	5-15
134*, 135*: Telstad---------	0-4	Loam----------	CL-ML	A-4	0-5	85-100	80-100	65-90	50-70	25-30	5-10
	4-13	Clay loam, loam	CL	A-6	0-5	95-100	90-100	80-95	60-80	30-40	10-20
	13-22	Clay loam, loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	80-95	60-80	25-35	5-15
	22-60	Loam, clay loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	75-90	55-75	25-35	5-15

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
134*, 135*:											
Hillon	0-7	Loam	ML, CL, CL-ML	A-4, A-6	0-5	85-100	80-100	80-90	65-75	20-35	NP-15
	7-60	Loam, clay loam	CL	A-6	0-5	85-100	80-100	80-90	65-80	25-35	10-20
136*:											
Telstad	0-4	Loam	CL-ML	A-4	0-5	85-100	80-100	65-90	50-70	25-30	5-10
	4-13	Clay loam, loam	CL	A-6	0-5	95-100	90-100	80-95	60-80	30-40	10-20
	13-22	Clay loam, loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	80-95	60-80	25-35	5-15
	22-60	Loam, clay loam	CL-ML, CL	A-6, A-4	0-5	95-100	90-100	75-90	55-75	25-35	5-15
Thoeny	0-6	Loam	CL	A-6	0-5	95-100	85-95	85-95	65-75	25-35	10-15
	6-31	Clay loam, clay	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
137	0-6	Loam	CL	A-6	0-5	95-100	85-95	85-95	65-75	25-35	10-15
Thoeny	6-31	Clay loam, clay	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
138*:											
Thoeny	0-6	Loam	CL	A-6	0-5	95-100	85-95	85-95	65-75	25-35	10-15
	6-31	Clay loam, clay	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
	31-60	Clay loam	CL	A-6, A-7	0-5	95-100	85-95	85-95	70-80	30-45	15-25
Absher	0-7	Clay loam	CL	A-6	0	95-100	75-100	70-100	60-90	25-40	10-20
	7-11	Silty clay, clay, clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-60	20-40
	11-60	Clay loam, clay, sandy clay loam.	CL, CH	A-7	0	95-100	75-100	70-100	60-95	40-55	20-35
139, 140	0-6	Fine sandy loam	SM, ML	A-4	0	100	100	70-85	40-55	20-30	NP-5
Trembles	6-16	Stratified fine sandy loam to loam.	SM, ML	A-4	0	100	100	65-85	35-60	20-30	NP-5
	16-60	Stratified fine sandy loam to loamy sand.	SM	A-4, A-2	0	100	100	60-80	25-50	15-25	NP-5
141	0-7	Loam	CL-ML	A-4	0-5	85-100	80-100	55-75	50-70	25-30	5-10
Turner	7-33	Clay loam, loam, gravelly loam.	CL, GC, SC	A-6	0-5	70-100	65-100	45-75	40-70	30-40	10-20
	33-60	Very gravelly loamy sand, very gravelly sand, extremely gravelly sand.	GP, GM, GP-GM	A-1	10-30	30-50	20-50	10-35	0-15	---	NP
142*:											
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Yetull	0-6	Fine sandy loam	SM, ML	A-4	0-10	95-100	95-100	70-90	35-55	---	NP
	6-60	Loamy coarse sand, sand, loamy sand.	SM, SP-SM	A-1, A-3, A-2	0-10	95-100	95-100	45-70	5-30	---	NP
143, 144. Typic Fluvaquents											
145. Typic Ustifluvents											

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
146*:											
Typic Ustorthents.											
Typic Ustifluvents.											
147*:											
Ustic Torriorthents.											
Ustic Torrifluvents.											
148----------	0-2	Clay----------	CL, CH	A-7	0	100	100	95-100	75-95	40-65	20-45
Vanda	2-60	Clay, silty clay, silty clay loam.	CL, CH	A-7, A-6	0	100	100	95-100	80-95	35-65	15-45
149, 150---------	0-7	Clay loam--------	CL	A-6	0-10	90-100	85-100	75-95	60-80	25-35	10-15
Vida	7-19	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-85	30-40	10-20
	19-60	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-80	25-40	10-20
151*, 152*:											
Vida----------	0-7	Clay loam--------	CL	A-6	0-10	90-100	85-100	75-95	60-80	25-35	10-15
	7-19	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-85	30-40	10-20
	19-60	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-80	25-40	10-20
Zahill----------	0-6	Loam----------	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
153, 154---------	0-7	Sandy loam--------	SM	A-2, A-4	0-5	85-100	85-100	60-70	30-40	---	NP
Wabek	7-60	Very gravelly sand, very gravelly loamy sand.	GM, GP-GM SM, SP-SM	A-1	0-5	40-60	30-50	15-40	5-20	---	NP
155----------	0-7	Clay----------	CL	A-7	0	90-100	90-100	80-100	65-90	40-50	15-25
Weingart	7-21	Clay, silty clay	CL, CH	A-7	0	90-100	90-100	80-100	75-95	40-65	20-40
	21-30	Clay, silty clay, silty clay loam.	CL, CH	A-6, A-7	0	90-100	90-100	75-100	70-90	35-60	15-35
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
156, 157---------	0-8	Loam----------	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-95	60-90	25-35	5-15
Williams	8-23	Clay loam, loam	CL	A-6	0-5	95-100	95-100	80-100	60-80	30-40	10-20
	23-60	Clay loam, loam	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	80-100	60-80	25-40	5-15
158*:											
Williams--------	0-8	Loam----------	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-95	60-90	25-35	5-15
	8-23	Clay loam, loam	CL	A-6	0-5	95-100	95-100	80-100	60-80	30-40	10-20
	23-60	Clay loam, loam	CL, CL-ML	A-6, A-4	0-5	95-100	95-100	80-100	60-80	25-40	5-15
Vida----------	0-7	Clay loam--------	CL	A-6	0-10	90-100	85-100	75-95	60-80	25-35	10-15
	7-19	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-85	30-40	10-20
	19-60	Clay loam, loam	CL	A-6	0-10	90-100	85-100	70-95	50-80	25-40	10-20
159, 160, 161----	0-4	Loam----------	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
Yamac	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
162*:											
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
163*:											
Yamac	0-4	Loam	CL-ML	A-4	0	85-100	80-100	60-85	55-75	25-30	5-10
	4-11	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	65-90	60-80	25-35	5-15
	11-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	60-85	55-75	25-35	5-15
Twilight	0-5	Fine sandy loam	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	5-25	Fine sandy loam, sandy loam.	SM	A-4	0	100	100	60-90	35-50	20-30	NP-5
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Fleak	0-7	Loamy sand	SM	A-4, A-2	0-5	95-100	95-100	45-80	20-40	---	NP
	7-16	Fine sand, loamy fine sand.	SM	A-2, A-4	0-5	95-100	95-100	40-85	20-40	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
164	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
Yawdim	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
165*:											
Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Badland.											
Cabbart	0-4	Silt loam	CL-ML	A-4	0	90-100	85-100	65-85	55-75	25-30	5-10
	4-13	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	90-100	85-100	60-90	55-85	25-35	5-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
166*:											
Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Badland.											
Gerdrum	0-7	Clay loam	CL	A-6	0	80-100	75-100	65-95	60-90	25-40	10-20
	7-11	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	90-100	90-100	85-100	75-95	40-60	20-40
	11-60	Clay loam, sandy clay loam, clay.	CL, SC, CH	A-6, A-7	0	90-100	90-100	80-95	45-75	35-55	15-35

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
167*:											
Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Kirby	0-5	Very channery loam.	GM, GM-GC	A-2, A-1, A-4	0-15	40-60	30-50	25-45	20-40	15-25	NP-10
	5-18	Extremely channery loam, extremely channery sandy loam, very channery loam.	GP-GM, GM, GM-GC	A-2, A-1	10-30	20-60	10-50	5-40	5-35	15-25	NP-10
	18-60	Fragmental material.	GP	A-1	40-60	5-15	0-10	0-5	0	---	NP
168, 169, 170---- Zahill	0-6	Loam	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
171*:											
Zahill	0-6	Loam	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
Badland.											
172*, 173*:											
Zahill	0-6	Loam	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
Cabba	0-5	Loam	ML, CL-ML	A-4	0-5	90-100	85-100	70-90	60-80	20-30	NP-10
	5-15	Silt loam, silty clay loam, loam.	GC, CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	85-100	80-95	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
174*:											
Zahill	0-6	Loam	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
Yawdim	0-6	Silty clay	CH, CL	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
175*:											
Zahill	0-6	Loam	CL-ML, ML	A-4	0-10	90-100	85-95	80-90	60-75	20-30	NP-10
	6-22	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
	22-60	Clay loam, loam	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	80-95	60-80	25-40	5-15
Yawdim	0-6	Silty clay	CL, CH	A-7	0	100	100	90-100	85-95	40-60	20-40
	6-15	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	100	90-100	70-95	25-60	10-40
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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 "Wind erodibility group" and "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	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
1----------	0-7	27-40	0.06-0.2	0.12-0.16	6.6-8.4	4-8	Moderate	0.43	5	6	1-2
Absher	7-11	35-60	<0.06	0.08-0.12	>7.8	8-16	High------	0.37			
	11-60	30-50	<0.06	0.04-0.10	>7.8	>8	High------	0.43			
2----------	0-7	30-40	0.2-0.6	0.12-0.16	6.6-9.0	4-16	Moderate	0.43	5	4	1-3
Adger	7-16	35-55	0.06-0.2	0.07-0.11	>7.8	>8	High------	0.43			
	16-60	25-40	0.06-0.2	0.06-0.10	>7.8	>8	High------	0.43			
3*:											
Adger----------	0-7	30-40	0.2-0.6	0.12-0.16	6.6-9.0	4-16	Moderate	0.43	5	4	1-3
	7-16	35-55	0.06-0.2	0.07-0.11	>7.8	>8	High------	0.43			
	16-60	25-40	0.06-0.2	0.06-0.10	>7.8	>8	High------	0.43			
Absher----------	0-7	27-40	0.06-0.2	0.12-0.16	6.6-8.4	4-8	Moderate	0.43	5	6	1-2
	7-11	35-60	<0.06	0.08-0.12	>7.8	8-16	High------	0.37			
	11-60	30-50	<0.06	0.04-0.10	>7.8	>8	High------	0.43			
4. Aeric Fluvaquents											
5----------	0-5	18-27	0.6-2.0	0.18-0.22	6.6-8.4	2-4	Low-------	0.37	5	6	1-3
Alona	5-13	25-35	0.2-0.6	0.16-0.20	>7.8	2-4	Moderate	0.37			
	13-22	25-35	0.2-0.6	0.11-0.14	>8.4	2-8	Moderate	0.37			
	22-60	25-35	0.2-0.6	0.08-0.11	>9.0	>8	Moderate	0.43			
6----------	0-5	18-27	0.6-2.0	0.15-0.19	7.9-8.4	4-8	Low-------	0.37	5	6	1-3
Alona	5-22	25-35	0.2-0.6	0.11-0.15	>8.4	8-16	Moderate	0.43			
	22-60	25-35	0.2-0.6	0.08-0.11	>9.0	>8	Moderate	0.43			
7. Badland											
8----------	0-16	5-15	2.0-6.0	0.12-0.16	6.6-7.8	<2	Low-------	0.20	5	3	.5-1
Banks	16-60	0-10	6.0-20	0.06-0.09	7.4-8.4	<2	Low-------	0.20			
9----------	0-7	40-50	0.06-0.2	0.12-0.18	7.4-8.4	<2	High------	0.32	2	4	1-3
Barkof	7-29	45-60	0.06-0.2	0.12-0.18	7.9-9.0	2-4	High------	0.32			
	29	---	---	---	---	---	----------	----			
10----------	0-2	40-60	<0.06	0.12-0.18	6.1-7.8	2-4	High------	0.37	2	4	1-2
Bascovy	2-11	45-60	<0.06	0.12-0.18	6.1-7.8	2-4	High------	0.37			
	11-23	45-60	<0.06	0.11-0.17	6.1-7.8	2-8	High------	0.37			
	23	---	---	---	---	---	----------	----			
11*:											
Bascovy----------	0-2	40-60	<0.06	0.12-0.18	6.1-7.8	2-4	High------	0.37	2	4	1-2
	2-11	45-60	<0.06	0.12-0.18	6.1-7.8	2-4	High------	0.37			
	11-23	45-60	<0.06	0.11-0.17	6.1-7.8	2-8	High------	0.37			
	23	---	---	---	---	---	----------	----			
Sunburst--------	0-3	30-40	0.06-0.2	0.14-0.18	7.4-8.4	<2	Moderate	0.32	5	4L	1-3
	3-19	35-50	0.06-0.2	0.12-0.16	7.9-8.4	2-4	High------	0.24			
	19-60	35-50	0.06-0.2	0.12-0.16	7.9-9.0	2-8	High------	0.24			
12----------	0-7	27-35	0.06-0.2	0.12-0.16	>7.3	4-8	Moderate	0.37	5	6	1-2
Benz	7-60	18-35	0.06-0.2	0.08-0.12	>8.4	>8	Moderate	0.37			
13----------	0-10	18-27	0.6-2.0	0.17-0.24	6.1-7.3	<2	Low-------	0.28	5	6	2-4
Bowbells	10-28	20-35	0.6-2.0	0.16-0.22	6.6-7.8	<2	Moderate	0.28			
	28-60	20-35	0.2-0.6	0.14-0.18	7.9-8.4	<2	Moderate	0.37			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
14, 15----------	0-4	18-26	0.6-2.0	0.18-0.20	6.1-7.3	<2	Low-------	0.32	5	6	2-4
Bryant	4-14	22-35	0.6-2.0	0.19-0.22	6.6-8.4	<2	Low-------	0.43			
	14-60	22-35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low-------	0.43			
16*:											
Bryant----------	0-4	18-26	0.6-2.0	0.18-0.20	6.1-7.3	<2	Low-------	0.32	5	6	2-4
	4-14	22-35	0.6-2.0	0.19-0.22	6.6-8.4	<2	Low-------	0.43			
	14-60	22-35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low-------	0.43			
Cambert---------	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low-------	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	----------	----			
17----------	0-10	18-27	0.6-2.0	0.11-0.14	7.4-8.4	>8	Low-------	0.37	5	6	3-5
Bryant Variant	10-42	18-35	0.6-2.0	0.10-0.13	7.9-9.0	>8	Low-------	0.32			
	42-60	25-35	0.6-2.0	0.11-0.14	7.9-9.0	4-16	Moderate	0.32			
18, 19----------	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.24	5	3	1-2
Busby	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low-------	0.20			
20*:											
Busby----------	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.24	5	3	1-2
	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low-------	0.20			
Fleak----------	0-7	0-15	6.0-20	0.06-0.12	6.6-8.4	<2	Low-------	0.17	2	2	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low-------	0.17			
	16	---	---	---	---	---	----------	----			
21*:											
Busby----------	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.24	5	3	1-2
	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low-------	0.20			
Twilight--------	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low-------	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low-------	0.24			
	25	---	---	---	---	---	----------	----			
22*:											
Busby----------	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.24	5	3	1-2
	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low-------	0.20			
Twilight--------	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low-------	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low-------	0.24			
	25	---	---	---	---	---	----------	----			
Fleak----------	0-7	10-18	2.0-6.0	0.10-0.16	6.6-7.8	<2	Low-------	0.24	2	3	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low-------	0.17			
	16	---	---	---	---	---	----------	----			
23*:											
Busby----------	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.24	5	3	1-2
	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low-------	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low-------	0.20			
Yamac----------	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low-------	0.37	5	4L	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
Fleak----------	0-7	10-18	2.0-6.0	0.10-0.16	6.6-7.8	<2	Low-------	0.24	2	3	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low-------	0.17			
	16	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
24*:											
Busby	0-5	10-18	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low	0.24	5	3	1-2
	5-11	10-22	0.6-2.0	0.12-0.16	7.4-8.4	<2	Low	0.37			
	11-60	10-18	2.0-6.0	0.10-0.15	7.9-8.4	<2	Low	0.20			
Yetull	0-6	0-10	2.0-6.0	0.11-0.15	6.6-7.8	<2	Low	0.20	5	3	1-2
	6-60	0-10	6.0-20	0.05-0.07	7.4-8.4	<4	Low	0.17			
25	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
Cabba	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
26*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
Badland.											
27*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
Barkof	0-7	40-50	0.06-0.2	0.12-0.18	7.4-8.4	<2	High	0.32	2	4	3-6
	7-29	45-60	0.06-0.2	0.12-0.18	7.9-9.0	2-4	High	0.32			
	29	---	---	---	---	---	---	---			
28*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
Brandenburg	0-5	10-20	0.6-2.0	0.18-0.20	6.6-7.8	<2	Low	0.24	1	5	1-3
	5-10	10-20	0.6-2.0	0.14-0.17	6.6-7.8	<2	Low	0.20			
	10-60	0	>20	0.01-0.03	6.6-7.8	<2	Low	0.10			
29*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
Dast	0-3	2-10	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	3	3	1-2
	3-25	2-10	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	25	---	---	---	---	---	---	---			
30*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
Wabek	0-7	5-15	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low	0.20	2	3	1-2
	7-60	0-10	>20	0.02-0.04	7.4-7.8	<2	Low	0.10			
Dast	0-3	2-10	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	3	3	1-2
	3-25	2-10	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	25	---	---	---	---	---	---	---			
31	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
Cabbart	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
32*:											
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
Badland.											

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
33*:											
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
Kirby	0-5	10-22	2.0-6.0	0.07-0.10	7.4-8.4	<2	Low	0.10	1	7	1-2
	5-18	8-22	6.0-20	0.03-0.06	7.9-8.4	<2	Low	0.05			
	18-60	0-1	>20	0.-0.01	7.9-8.4	<2	Low	0.00			
34*:											
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
Twilight	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low	0.24			
	25	---	---	---	---	---	---	---			
35*, 36*:											
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			
37	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
Cambert	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
38*:											
Cambert	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
Barkof	0-7	40-50	0.06-0.2	0.12-0.18	7.4-8.4	<2	High	0.32	2	4	1-3
	7-29	45-60	0.06-0.2	0.12-0.18	7.9-9.0	2-4	High	0.32			
	29	---	---	---	---	---	---	---			
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
39*:											
Cambert	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
40*:											
Cambert	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
Dast	0-3	2-10	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	3	3	1-2
	3-25	2-10	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	25	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
40*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
41	0-6	18-27	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.37	3	6	1-2
Cambeth	6-11	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	11-35	18-35	0.6-2.0	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
	35	---	---	---	---	---	---	---			
42*:											
Cambeth	0-6	18-27	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.37	3	6	1-2
	6-11	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	11-35	18-35	0.6-2.0	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
	35	---	---	---	---	---	---	---			
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
43*:											
Cambeth	0-6	18-27	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.37	3	6	1-2
	6-11	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	11-35	18-35	0.6-2.0	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
	35	---	---	---	---	---	---	---			
Twilight	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low	0.24			
	25	---	---	---	---	---	---	---			
Cabbart	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	---	---			
44	0-3	18-27	0.6-2.0	0.20-0.24	6.6-8.4	<2	Moderate	0.37	5	6	1-3
Cherry	3-60	18-35	0.2-0.6	0.16-0.22	7.9-9.0	<2	Moderate	0.37			
45*:											
Cherry	0-3	18-27	0.6-2.0	0.20-0.24	6.6-8.4	<2	Moderate	0.37	5	6	1-3
	3-60	18-35	0.2-0.6	0.16-0.22	7.9-9.0	<2	Moderate	0.37			
Havrelon	0-5	15-25	0.6-2.0	0.16-0.20	7.4-7.8	<2	Moderate	0.32	5	4L	1-3
	5-60	18-30	0.6-2.0	0.15-0.19	7.4-7.8	<2	Moderate	0.32			
Trembles	0-6	10-20	2.0-6.0	0.12-0.16	6.6-8.4	<2	Low	0.20	5	3	1-3
	6-16	8-15	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	16-60	8-15	2.0-6.0	0.10-0.14	7.4-9.0	<2	Low	0.20			
46, 47, 48, 49---	0-6	5-18	2.0-6.0	0.12-0.16	6.6-8.4	<2	Low	0.20	5	3	1-2
Chinook	6-29	5-18	2.0-6.0	0.11-0.15	6.6-9.0	<2	Low	0.20			
	29-60	5-15	2.0-6.0	0.08-0.12	7.4-9.0	<2	Low	0.20			
50	0-8	18-27	0.6-2.0	0.14-0.18	6.6-8.4	<4	Low	0.37	5	6	1-3
Creed	8-24	35-55	0.06-0.2	0.10-0.14	7.9-9.0	4-8	High	0.28			
	24-60	27-45	0.06-0.2	0.08-0.12	7.9-9.0	4-16	Moderate	0.32			
51*:											
Creed	0-8	18-27	0.6-2.0	0.14-0.18	6.6-8.4	<4	Low	0.37	5	6	1-3
	8-24	35-55	0.06-0.2	0.10-0.14	7.9-9.0	4-8	High	0.28			
	24-60	27-45	0.06-0.2	0.08-0.12	7.9-9.0	4-16	Moderate	0.32			
Gerdrum	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			
52, 53	0-3	2-10	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	3	3	1-2
Dast	3-25	2-10	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	25	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
54*, 55*:											
Dast	0-3	2-10	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	3	3	1-2
	3-25	2-10	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	25	---	---	---	---	---	---	---			
Blanchard	0-7	0-5	6.0-20	0.06-0.09	5.6-7.8	<2	Low	0.17	5	2	.5-1
	7-60	0-5	6.0-20	0.06-0.08	6.6-7.8	<2	Low	0.17			
56	0-7	40-50	<0.2	0.14-0.18	6.6-7.8	<2	High	0.28	5	8	2-6
Dimmick	7-60	40-60	<0.06	0.13-0.17	7.4-8.4	<2	High	0.28			
57	0-7	40-50	<0.2	0.14-0.18	6.6-7.8	<2	High	0.28	5	4	2-5
Dimmick	7-60	40-60	<0.06	0.13-0.17	7.4-8.4	2-8	High	0.28			
58, 59	0-3	32-40	0.2-0.6	0.16-0.20	6.1-7.8	<2	Moderate	0.37	5	4	1-3
Ethridge	3-11	35-45	0.06-0.2	0.12-0.16	6.6-8.4	<2	High	0.32			
	11-60	30-45	0.06-0.2	0.16-0.20	7.4-9.0	2-4	Moderate	0.37			
60	0-8	20-27	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low	0.37	5	6	1-3
Evanston	8-26	25-35	0.6-2.0	0.12-0.18	6.6-7.8	<2	Moderate	0.37			
	26-60	15-30	0.6-2.0	0.16-0.18	7.9-9.0	<4	Moderate	0.37			
61	0-8	20-27	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low	0.37	5	6	1-3
Evanston	8-26	25-35	0.6-2.0	0.12-0.18	6.6-7.8	<2	Moderate	0.37			
	26-61	15-30	0.6-2.0	0.16-0.18	7.9-9.0	<4	Moderate	0.37			
62*:											
Evanston	0-8	20-27	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low	0.37	5	6	1-3
	8-26	25-35	0.6-2.0	0.12-0.18	6.6-7.8	<2	Moderate	0.37			
	26-60	15-30	0.6-2.0	0.16-0.18	7.9-9.0	<4	Moderate	0.37			
Gerdrum	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			
63	0-4	15-25	0.6-2.0	0.19-0.21	6.1-7.8	<2	Low	0.37	5	6	2-4
Farland	4-15	27-35	0.6-2.0	0.16-0.20	6.6-7.8	<2	Moderate	0.32			
	15-60	20-35	0.6-2.0	0.17-0.20	6.6-8.4	<4	Moderate	0.32			
64	0-6	15-27	0.6-2.0	0.16-0.20	6.1-7.8	<2	Low	0.37	5	6	2-4
Farnuf	6-15	25-35	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32			
	15-60	20-30	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
65, 66	0-6	18-27	0.6-2.0	0.18-0.22	6.6-8.4	<2	Low	0.37	5	6	1-2
Floweree	6-10	20-35	0.2-0.6	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	10-60	20-35	0.2-0.6	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
67*:											
Floweree	0-6	18-27	0.6-2.0	0.18-0.22	6.6-8.4	<2	Low	0.37	5	6	1-2
	6-10	20-35	0.2-0.6	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	10-60	20-35	0.2-0.6	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
Cambeth	0-6	18-27	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.37	3	6	1-2
	6-11	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	11-35	18-35	0.6-2.0	0.15-0.19	7.9-9.0	2-4	Moderate	0.32			
	35	---	---	---	---	---	---	---			
68, 69	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
Gerdrum	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			
70*:											
Gerdrum	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
70*:											
Absher	0-7	27-40	0.06-0.2	0.12-0.16	6.6-8.4	4-8	Moderate	0.43	5	6	1-2
	7-11	35-60	<0.06	0.08-0.12	>7.8	8-16	High	0.37			
	11-60	30-50	<0.06	0.04-0.10	>7.8	>8	High	0.43			
71*, 72*:											
Gerdrum	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			
Fleak	0-7	10-18	2.0-6.0	0.10-0.16	6.6-7.8	<2	Low	0.24	2	3	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low	0.17			
	16	---	---	---	---	---	---	---			
73	0-6	5-15	2.0-6.0	0.12-0.18	7.4-8.4	<4	Low	0.20	5	3	.5-2
Glendive	6-60	5-18	2.0-6.0	0.10-0.16	7.4-9.0	2-8	Low	0.20			
74	0-6	10-18	0.6-2.0	0.14-0.20	7.4-8.4	<4	Low	0.32	5	5	.5-2
Glendive	6-60	5-18	2.0-6.0	0.10-0.16	7.4-9.0	2-8	Low	0.20			
75	0-6	10-20	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.32	5	4L	.5-2
Glendive	6-60	5-18	2.0-6.0	0.10-0.14	7.4-9.0	2-8	Low	0.28			
76	0-6	27-35	0.6-2.0	0.14-0.20	7.4-8.4	<4	Low	0.32	5	5	.5-2
Glendive	6-60	5-18	2.0-6.0	0.10-0.16	7.4-9.0	2-8	Low	0.20			
77	0-6	27-35	0.6-2.0	0.16-0.20	7.4-8.4	<4	Moderate	0.28	5	4L	.5-2
Glendive	6-60	5-18	2.0-6.0	0.10-0.14	7.4-9.0	2-8	Low	0.28			
78*:											
Glendive	0-6	5-15	2.0-6.0	0.12-0.16	7.4-8.4	<4	Low	0.20	5	3	.5-2
	6-60	5-18	2.0-6.0	0.10-0.14	7.4-9.0	2-8	Low	0.28			
Hanly	0-4	0-10	6.0-20	0.08-0.12	6.6-8.4	<2	Low	0.17	5	2	<1
	4-60	0-12	6.0-20	0.06-0.09	6.6-8.4	<2	Low	0.17			
79	0-4	0-10	6.0-20	0.08-0.12	6.6-8.4	<2	Low	0.17	5	2	<1
Hanly	4-60	0-12	6.0-20	0.06-0.09	6.6-8.4	<2	Low	0.17			
80, 81	0-5	40-55	0.06-0.2	0.14-0.18	7.4-8.4	<4	High	0.32	5	4	.5-1
Harlem	5-60	35-60	0.06-0.2	0.14-0.18	7.4-8.4	<4	High	0.37			
82, 83	0-5	15-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	5	4L	.5-2
Havre	5-60	18-35	0.6-2.0	0.14-0.18	7.4-8.4	<8	Low	0.28			
84, 85	0-9	27-40	0.2-0.6	0.14-0.18	7.4-8.4	<4	Moderate	0.32	5	4L	.5-2
Havre	9-60	18-35	0.6-2.0	0.14-0.18	7.4-8.4	<8	Low	0.28			
86, 87	0-5	15-25	0.6-2.0	0.20-0.24	7.4-7.8	<2	Moderate	0.32	5	4L	1-2
Havrelon	5-60	18-30	0.6-2.0	0.15-0.19	7.4-7.8	<2	Moderate	0.32			
88	0-5	20-27	0.6-2.0	0.13-0.17	7.4-7.8	<4	Moderate	0.37	5	6	1-2
Havrelon	5-60	18-35	0.6-2.0	0.09-0.13	>7.8	8-16	Moderate	0.28			
89, 90	0-6	15-25	0.6-2.0	0.20-0.24	7.4-7.8	<2	Moderate	0.32	5	4L	1-2
Havrelon	6-60	18-30	0.6-2.0	0.15-0.19	7.4-7.8	<2	Moderate	0.32			
91, 92, 93	0-7	20-27	0.6-2.0	0.18-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
Hillon	7-60	20-35	0.06-0.2	0.15-0.18	7.9-9.0	<2	Moderate	0.32			
94*:											
Hillon	0-7	20-27	0.6-2.0	0.18-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	7-60	20-35	0.06-0.2	0.15-0.18	7.9-9.0	<2	Moderate	0.32			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
94*:											
Badland.											
95*:											
Hillon	0-7	20-27	0.6-2.0	0.18-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	7-60	20-35	0.06-0.2	0.15-0.18	7.9-9.0	<2	Moderate	0.32			
Yamac	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	4L	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
Fleak	0-7	10-18	2.0-6.0	0.10-0.16	6.6-7.8	<2	Low	0.24	2	3	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low	0.17			
	16	---	---	---	---	---	---	----			
96	0-5	40-50	0.06-0.2	0.14-0.18	6.6-8.4	<2	High	0.32	3	4L	1-2
Hoffmanville	5-28	35-50	0.06-0.2	0.13-0.17	6.6-8.4	<2	High	0.32			
	28-60	0-10	6.0-20	0.06-0.08	6.6-8.4	<2	Low	0.17			
97, 98	0-6	18-27	0.6-2.0	0.16-0.20	6.6-7.8	<2	Low	0.37	5	6	1-3
Kremlin	6-10	18-30	0.6-2.0	0.16-0.20	6.6-7.8	<2	Moderate	0.37			
	10-18	18-30	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	18-60	10-25	0.6-2.0	0.14-0.18	7.4-9.0	<4	Low	0.37			
99	0-4	10-27	2.0-6.0	0.17-0.22	6.6-7.3	<2	Low	0.28	3	5	1-3
Lehr	4-18	18-30	2.0-6.0	0.17-0.20	6.6-8.4	<2	Moderate	0.28			
	18-60	0-10	>20	0.02-0.04	7.4-8.4	<2	Low	0.10			
100, 101	0-5	5-18	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low	0.20	5	3	1-3
Lisk	5-15	5-18	2.0-6.0	0.11-0.15	7.9-8.4	<2	Low	0.20			
	15-41	5-18	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low	0.20			
	41-60	0-10	2.0-6.0	0.07-0.10	7.9-8.4	<2	Low	0.17			
102	0-6	20-40	0.2-0.6	0.18-0.24	7.4-8.4	<2	Moderate	0.28	5	6	.5-2
Lohler	6-60	35-50	0.06-0.2	0.13-0.17	7.4-8.4	<2	High	0.28			
103, 104	0-5	40-50	0.06-0.6	0.15-0.18	7.4-8.4	<2	High	0.28	5	4	.5-2
Lohler	5-60	35-50	0.06-0.2	0.13-0.17	7.4-8.4	<2	High	0.28			
105	0-7	27-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.32	5	4L	1-3
Lonna	7-12	18-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.37			
	12-60	18-35	0.6-2.0	0.16-0.20	7.9-9.0	<4	Moderate	0.37			
106*:											
Lonna	0-7	27-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.32	5	4L	1-3
	7-12	18-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.37			
	12-60	18-35	0.6-2.0	0.16-0.20	7.9-9.0	<4	Moderate	0.37			
Havre	0-5	10-22	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	5-60	18-30	0.6-2.0	0.14-0.18	7.4-8.4	<2	Low	0.28			
Glendive	0-6	5-15	2.0-6.0	0.12-0.18	7.4-9.0	<4	Low	0.20	5	3	.5-2
	6-60	5-18	2.0-6.0	0.10-0.16	7.4-9.0	2-8	Low	0.20			
107, 108, 109	0-3	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	6	1-3
Macar	3-34	18-35	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	34-60	15-30	0.6-2.0	0.13-0.17	7.4-9.0	<2	Moderate	0.32			
110	0-7	18-27	0.6-2.0	0.16-0.20	7.9-8.4	<2	Low	0.37	5	4L	1-3
Macar	7-20	18-35	0.6-2.0	0.12-0.16	8.5-9.0	4-8	Moderate	0.37			
	20-60	18-35	0.6-2.0	0.10-0.13	8.5-9.0	8-16	Moderate	0.37			
111*:											
Macar	0-3	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	6	1-3
	3-34	18-35	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	34-60	15-30	0.6-2.0	0.13-0.17	7.4-9.0	<2	Moderate	0.32			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
111*:											
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
112*:											
Macar	0-3	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	6	1-3
	3-34	18-35	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	34-60	15-30	0.6-2.0	0.13-0.17	7.4-9.0	<2	Moderate	0.32			
Cambert	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
113	0-7	40-60	0.06-0.2	0.14-0.18	7.4-8.4	2-4	High	0.37	5	4	.5-2
Marias	7-33	45-60	<0.06	0.12-0.16	7.4-8.4	2-4	High	0.37			
	33-60	45-60	<0.06	0.12-0.16	7.4-8.4	2-8	High	0.37			
114	0-4	40-60	0.06-0.2	0.14-0.18	7.4-8.4	<4	High	0.37	5	4	.5-1
Marvan	4-35	45-60	<0.06	0.10-0.14	7.9-9.0	2-8	High	0.37			
	35-60	30-50	<0.06	0.08-0.11	7.9-9.0	8-16	High	0.37			
115*:											
Neldore	0-3	40-50	0.06-0.2	0.14-0.18	6.6-7.3	<2	High	0.32	1	4	1-3
	3-16	40-60	0.06-0.2	0.12-0.16	5.6-7.3	<4	High	0.32			
	16	---	---	---	---	---	---	---			
Badland.											
Bascovy	0-2	40-60	<0.06	0.12-0.18	6.1-7.8	2-4	High	0.37	2	4	1-2
	2-11	45-60	<0.06	0.12-0.18	6.1-7.8	2-4	High	0.37			
	11-23	45-60	<0.06	0.11-0.17	6.1-7.8	2-8	High	0.37			
	23	---	---	---	---	---	---	---			
116*:											
Neldore	0-3	40-50	0.06-0.2	0.14-0.18	6.6-7.3	<2	High	0.32	1	4	1-3
	3-16	40-60	0.06-0.2	0.12-0.16	5.6-7.3	<4	High	0.32			
	16	---	---	---	---	---	---	---			
Bascovy	0-2	40-60	<0.06	0.12-0.18	6.1-7.8	2-4	High	0.37	2	4	1-2
	2-11	45-60	<0.06	0.12-0.18	6.1-7.8	2-4	High	0.37			
	11-23	45-60	<0.06	0.11-0.17	6.1-7.8	2-8	High	0.37			
	23	---	---	---	---	---	---	---			
117*:											
Neldore	0-3	40-50	0.06-0.2	0.14-0.18	6.6-7.3	<2	High	0.32	1	4	1-3
	3-16	40-60	0.06-0.2	0.12-0.16	5.6-7.3	<4	High	0.32			
	16	---	---	---	---	---	---	---			
Yamac	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	4L	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
Badland.											
118	0-14	60-75	<0.06	0.14-0.18	6.6-8.4	2-4	High	0.37	5	4	.5-1
Pendroy	14-47	60-75	<0.06	0.13-0.17	7.4-8.4	2-4	High	0.37			
	47-60	50-65	<0.06	0.12-0.16	7.4-8.4	2-4	High	0.37			
119	0-7	18-27	0.6-2.0	0.18-0.22	7.4-8.4	<2	Low	0.37	3	4L	1-2
Ridgelawn	7-24	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	24-60	0-10	6.0-20	0.06-0.09	7.4-8.4	<2	Low	0.15			
120, 121	0-4	15-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.43	5	5	1-3
Rominell	4-9	10-27	0.6-2.0	0.13-0.17	7.4-8.4	<2	Low	0.43			
	9-25	20-35	0.06-0.2	0.11-0.15	>8.4	2-8	Moderate	0.37			
	25-60	10-32	0.06-0.2	0.10-0.14	>8.4	2-8	Low	0.37			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
122*:											
Rominell	0-4	15-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.43	5	5	1-3
	4-9	10-27	0.6-2.0	0.13-0.17	7.4-8.4	<2	Low	0.43			
	9-25	20-35	0.06-0.2	0.11-0.15	>8.4	2-8	Moderate	0.37			
	25-60	10-32	0.06-0.2	0.10-0.14	>8.4	2-8	Low	0.37			
Yamac	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	5	5	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
123	0-7	27-35	0.6-2.0	0.16-0.20	6.6-7.8	<2	Moderate	0.37	5	7	2-4
Savage	7-28	35-45	0.06-0.2	0.14-0.18	6.6-8.4	2-8	High	0.32			
	28-60	30-45	0.06-0.2	0.13-0.17	7.4-8.4	2-8	High	0.32			
124, 125	0-4	10-27	0.6-2.0	0.20-0.22	6.6-7.3	<2	Low	0.28	5	6	2-4
Shambo	4-14	18-30	0.6-2.0	0.17-0.19	6.6-8.4	<2	Moderate	0.28			
	14-60	18-30	0.6-2.0	0.17-0.19	7.4-9.0	<2	Moderate	0.28			
126*:											
Shambo	0-4	10-27	0.6-2.0	0.20-0.22	6.6-7.3	<2	Low	0.28	5	6	2-4
	4-14	18-30	0.6-2.0	0.17-0.19	6.6-8.4	<2	Moderate	0.28			
	14-60	18-30	0.6-2.0	0.17-0.19	7.4-9.0	<2	Moderate	0.28			
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
127*:											
Shambo	0-4	10-27	0.6-2.0	0.20-0.22	6.6-7.3	<2	Low	0.28	5	6	2-4
	4-14	18-30	0.6-2.0	0.17-0.19	6.6-8.4	<2	Moderate	0.28			
	14-60	18-30	0.6-2.0	0.17-0.19	7.4-9.0	<2	Moderate	0.28			
Cambert	0-4	18-25	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low	0.37	3	6	1-3
	4-13	18-35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.32			
	13-21	18-35	0.6-2.0	0.16-0.20	7.4-9.0	<4	Moderate	0.32			
	21	---	---	---	---	---	---	---			
128, 129, 130	0-3	30-40	0.06-0.2	0.14-0.18	7.4-8.4	<2	Moderate	0.32	5	4L	1-3
Sunburst	3-19	35-50	0.06-0.2	0.12-0.16	7.9-8.4	2-4	High	0.24			
	19-60	35-50	0.06-0.2	0.12-0.16	7.9-9.0	2-8	High	0.24			
131, 132	0-4	10-20	2.0-6.0	0.12-0.16	6.1-7.8	<2	Low	0.20	5	3	1-3
Tally	4-20	5-18	2.0-6.0	0.12-0.16	6.6-8.4	<2	Low	0.20			
	20-31	5-15	2.0-6.0	0.10-0.13	7.4-8.4	<2	Low	0.20			
	31-60	5-10	6.0-20	0.06-0.10	7.4-8.4	<2	Low	0.17			
133	0-4	18-27	0.6-2.0	0.16-0.20	6.6-7.8	<2	Low	0.37	5	6	1-3
Telstad	4-13	25-35	0.2-0.6	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	13-22	20-32	0.2-0.6	0.14-0.18	7.9-8.4	2-4	Moderate	0.37			
	22-60	20-32	0.06-0.2	0.14-0.18	7.9-9.0	2-4	Moderate	0.43			
134*, 135*:											
Telstad	0-4	18-27	0.6-2.0	0.16-0.20	6.6-7.8	<2	Low	0.37	5	6	1-3
	4-13	25-35	0.2-0.6	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	13-22	20-32	0.2-0.6	0.14-0.18	7.9-8.4	2-4	Moderate	0.37			
	22-60	20-32	0.06-0.2	0.14-0.18	7.9-9.0	2-4	Moderate	0.43			
Hillon	0-7	20-27	0.6-2.0	0.18-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	7-60	20-35	0.06-0.2	0.15-0.18	7.9-9.0	<2	Moderate	0.32			
136*:											
Telstad	0-4	18-27	0.6-2.0	0.16-0.20	6.6-7.8	<2	Low	0.37	5	6	1-3
	4-13	25-35	0.2-0.6	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	13-22	20-32	0.2-0.6	0.14-0.18	7.9-8.4	2-4	Moderate	0.37			
	22-60	20-32	0.06-0.2	0.14-0.18	7.9-9.0	2-4	Moderate	0.43			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
136*:											
Thoeny	0-6	15-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.49	5	5	1-2
	6-31	35-50	<0.06	0.10-0.14	>7.8	4-8	Moderate	0.32			
	31-60	27-40	<0.06	0.10-0.14	>7.8	4-16	Moderate	0.32			
137	0-6	15-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.49	5	5	1-2
Thoeny	6-31	35-50	<0.06	0.10-0.14	>7.8	4-8	Moderate	0.32			
	31-60	27-40	<0.06	0.10-0.14	>7.8	4-16	Moderate	0.32			
138*:											
Thoeny	0-6	15-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.49	5	5	1-2
	6-31	35-50	<0.06	0.10-0.14	>7.8	4-8	Moderate	0.32			
	31-60	27-40	<0.06	0.10-0.14	>7.8	4-16	Moderate	0.32			
Absher	0-7	27-40	0.06-0.2	0.12-0.16	6.6-8.4	4-8	Moderate	0.43	5	6	1-2
	7-11	35-60	<0.06	0.08-0.12	>7.8	8-16	High	0.37			
	11-60	30-50	<0.06	0.04-0.10	>7.8	>8	High	0.43			
139, 140	0-6	10-20	2.0-6.0	0.12-0.16	6.6-8.4	<2	Low	0.20	5	3	1-3
Trembles	6-16	8-15	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.20			
	16-60	8-15	2.0-6.0	0.10-0.14	7.4-9.0	<2	Low	0.20			
141	0-7	15-25	0.6-2.0	0.16-0.20	6.1-7.8	<2	Low	0.37	3	6	2-4
Turner	7-33	25-35	0.6-2.0	0.12-0.16	6.6-8.4	<2	Moderate	0.28			
	33-60	0-5	6.0-20	0.01-0.04	7.4-8.4	<2	Low	0.05			
142*:											
Twilight	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low	0.24			
	25	---	---	---	---	---	---	---			
Yetull	0-6	0-10	2.0-6.0	0.11-0.15	6.6-7.8	<2	Low	0.20	5	3	1-2
	6-60	0-10	6.0-20	0.05-0.07	7.4-8.4	<4	Low	0.17			
143, 144. Typic Fluvaquents											
145. Typic Ustifluvents											
146*: Typic Ustorthents.											
Typic Ustifluvents.											
147*: Ustic Torriorthents.											
Ustic Torrifluvents.											
148	0-2	40-60	<0.06	0.08-0.12	>7.8	>8	High	0.37	5	4	.5-2
Vanda	2-60	35-60	<0.06	0.08-0.12	>7.8	>8	High	0.37			
149, 150	0-7	27-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32	5	6	1-3
Vida	7-19	25-35	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32			
	19-60	25-35	0.2-0.6	0.14-0.18	7.9-9.0	<2	Moderate	0.32			
151*, 152*:											
Vida	0-7	27-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32	5	6	1-3
	7-19	25-35	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32			
	19-60	25-35	0.2-0.6	0.14-0.18	7.9-9.0	<2	Moderate	0.32			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
151*, 152*:											
Zahill----------	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low-------	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
153, 154---------	0-7	5-15	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low-------	0.20	2	3	1-2
Wabek	7-60	0-10	>20	0.02-0.04	7.4-7.8	<2	Low-------	0.10			
155---------------	0-7	40-45	<0.06	0.15-0.18	>7.3	<2	High------	0.37	2	4	1-2
Weingart	7-21	40-60	<0.06	0.12-0.15	6.6-9.0	4-16	High------	0.37			
	21-30	35-55	<0.06	0.10-0.14	7.9-9.0	8-16	High------	0.37			
	30	---	---	---	---	---	----------	----			
156, 157---------	0-8	15-27	0.6-2.0	0.17-0.24	6.6-7.8	<2	Low-------	0.28	5	6	2-4
Williams	8-23	24-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.28			
	23-60	18-35	0.2-0.6	0.15-0.18	7.9-8.4	<2	Moderate	0.37			
158*:											
Williams---------	0-8	15-27	0.6-2.0	0.17-0.24	6.6-7.8	<2	Low-------	0.28	5	6	2-4
	8-23	24-35	0.6-2.0	0.16-0.20	6.6-8.4	<2	Moderate	0.28			
	23-60	18-35	0.2-0.6	0.15-0.18	7.9-8.4	<2	Moderate	0.37			
Vida------------	0-7	27-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32	5	6	1-3
	7-19	25-35	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.32			
	19-60	25-35	0.2-0.6	0.14-0.18	7.9-9.0	<2	Moderate	0.32			
159, 160, 161----	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low-------	0.37	5	5	1-2
Yamac	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
162*:											
Yamac-----------	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low-------	0.37	5	5	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
Twilight--------	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low-------	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low-------	0.24			
	25	---	---	---	---	---	----------	----			
163*:											
Yamac-----------	0-4	18-27	0.6-2.0	0.16-0.20	6.6-8.4	<2	Low-------	0.37	5	5	1-2
	4-11	18-30	0.6-2.0	0.14-0.18	6.6-8.4	<2	Moderate	0.37			
	11-60	18-30	0.6-2.0	0.14-0.18	7.9-9.0	<4	Moderate	0.37			
Twilight--------	0-5	15-20	2.0-6.0	0.10-0.14	6.6-7.8	<2	Low-------	0.24	3	3	1-2
	5-25	10-18	2.0-6.0	0.09-0.13	7.4-8.4	<2	Low-------	0.24			
	25	---	---	---	---	---	----------	----			
Fleak-----------	0-7	10-18	2.0-6.0	0.10-0.16	6.6-7.8	<2	Low-------	0.24	2	3	<1
	7-16	0-15	6.0-20	0.06-0.10	6.6-8.4	<2	Low-------	0.17			
	16	---	---	---	---	---	----------	----			
164---------------	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High------	0.32	1	4	1-2
Yawdim	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High------	0.32			
	15	---	---	---	---	---	----------	----			
165*:											
Yawdim-----------	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High------	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High------	0.32			
	15	---	---	---	---	---	----------	----			
Badland.											
Cabbart---------	0-4	18-27	0.6-2.0	0.17-0.21	7.4-8.4	<4	Low-------	0.37	2	4L	1-2
	4-13	15-35	0.6-2.0	0.15-0.19	7.4-8.4	2-8	Moderate	0.37			
	13	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 12.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
166*:											
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			
Badland.											
Gerdrum	0-7	27-40	0.6-2.0	0.14-0.18	6.6-7.8	<2	Moderate	0.37	5	6	1-3
	7-11	35-55	0.06-0.2	0.10-0.14	7.4-9.0	2-8	High	0.32			
	11-60	30-50	0.06-0.2	0.07-0.11	7.9-9.0	8-16	High	0.37			
167*:											
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			
Kirby	0-5	10-22	2.0-6.0	0.07-0.10	7.4-8.4	<2	Low	0.10	1	7	1-2
	5-18	8-22	6.0-20	0.03-0.06	7.9-8.4	<2	Low	0.05			
	18-60	0-1	>20	0.-0.01	7.9-8.4	<2	Low	0.00			
168, 169, 170---- Zahill	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
171*:											
Zahill	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
Badland.											
172*, 173*:											
Zahill	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
Cabba	0-5	10-27	0.6-2.0	0.16-0.20	7.4-8.4	<4	Low	0.37	2	4L	1-3
	5-15	20-35	0.6-2.0	0.14-0.18	7.9-9.0	2-8	Moderate	0.37			
	15	---	---	---	---	---	---	---			
174*:											
Zahill	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			
175*:											
Zahill	0-6	20-27	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.37	5	4L	.5-2
	6-22	25-35	0.2-0.6	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	22-60	25-35	0.2-0.6	0.14-0.18	7.4-9.0	<2	Moderate	0.32			
Yawdim	0-6	40-50	0.06-0.2	0.15-0.18	7.4-7.8	<2	High	0.32	1	4L	1-2
	6-15	35-50	0.06-0.2	0.14-0.20	7.9-8.4	<2	High	0.32			
	15	---	---	---	---	---	---	---			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," and "apparent," are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
1---- Absher	D	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
2---- Adger	D	None	---	---	>6.0	---	---	>60	---	Low	High	High.
3*:												
Adger----	D	None	---	---	>6.0	---	---	>60	---	Low	High	High.
Absher----	D	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
4. Aeric Fluvaquents												
5---- Alona	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
6---- Alona	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	High	High.
7. Badland												
8---- Banks	A	Rare	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
9---- Barkof	D	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
10---- Bascovy	D	None	---	---	>6.0	---	---	20-40	Soft	Low	High	High.
11*:												
Bascovy----	D	None	---	---	>6.0	---	---	20-40	Soft	Low	High	High.
Sunburst----	C	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
12---- Benz	D	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
13---- Bowbells	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
14, 15---- Bryant	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
16*:												
Bryant----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Cambert----	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
17---- Bryant Variant	B	None	---	---	4.0-6.0	Apparent	May-Aug	>60	---	Moderate	High	High.
18, 19---- Busby	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
20*:												
Busby----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Fleak----	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Moderate.
21*:												
Busby----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Twilight----	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Moderate	Low.
22*:												
Busby----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Twilight----	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Moderate	Low.
Fleak----	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Moderate.
23*:												
Busby----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Yamac----	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Fleak----	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Moderate.
24*:												
Busby----	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Yetull----	A	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
25---- Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
26*:												
Cabba----	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
Badland.												
27*:												
Cabba----	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
Barkof----	D	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
28*:												
Cabba----	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
Brandenburg----	A	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
29*:												
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
Dast	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
30*:												
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
Wabek	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
Dast	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
31--Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
32*:												
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
Badland.												
33*:												
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
Kirby	A	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
34*:												
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
Twilight	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Moderate	Low.
35*, 36*:												
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
Yawdim	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Moderate.
37--Cambert	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
38*:												
Cambert	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Barkof	D	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Moderate.
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
39*:												
Cambert	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
40*:												
Cambert	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Dast	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
40*: Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
41--- Cambeth	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
42*: Cambeth	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
43*: Cambeth	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Twilight	C	None	---	---	>6.0	---	---	20-40	Soft	Low	Moderate	Low.
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
44--- Cherry	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
45*: Cherry	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Havrelon	B	Occasional	Brief	Apr-Jun	>6.0	---	---	>60	---	Moderate	High	Low.
Trembles	B	Occasional	Brief	Apr-Jun	>6.0	---	---	>60	---	Moderate	High	Low.
46, 47, 48, 49--- Chinook	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
50--- Creed	C	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
51*: Creed	C	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
Gerdrum	C	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
52, 53--- Dast	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
54*, 55*: Dast	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
Blanchard	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Moderate.
56--- Dimmick	D	None	---	---	+1-2.0	Apparent	Apr-Sep	>60	---	Moderate	High	Low.
57--- Dimmick	D	None	---	---	1.0-3.0	Apparent	Apr-Aug	>60	---	Moderate	High	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
58, 59---------- Ethridge	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
60, 61---------- Evanston	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
62*:												
Evanston---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Gerdrum----------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
63---------- Farland	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
64---------- Farnuf	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
65, 66---------- Floweree	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
67*:												
Floweree---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Cambeth----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	High-----	Low.
68, 69---------- Gerdrum	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
70*:												
Gerdrum----------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Absher-----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
71*, 72*:												
Gerdrum----------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Yawdim-----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low------	High-----	Moderate.
Fleak------------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low------	Moderate	Moderate.
73, 74---------- Glendive	B	Rare--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
75---------- Glendive	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
76---------- Glendive	B	Rare--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
77---------- Glendive	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
78*:												
Glendive	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Hanly	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
79--- Hanly	A	Occasional	Brief	Mar-Jun	>6.0	---	---	>60	---	Low	Moderate	Low.
80--- Harlem	C	Rare	---	---	>6.0	---	---	>60	---	Low	High	Low.
81--- Harlem	C	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
82--- Havre	B	Rare	---	---	>6.0	---	---	>60	---	Low	High	Low.
83--- Havre	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
84--- Havre	B	Rare	---	---	>6.0	---	---	>60	---	Low	High	Low.
85--- Havre	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
86--- Havrelon	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
87--- Havrelon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
88--- Havrelon	B	Occasional	Brief	Apr-Jul	>6.0	---	---	>60	---	Moderate	High	High.
89--- Havrelon	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
90--- Havrelon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
91, 92, 93--- Hillon	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
94*:												
Hillon	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
Badland.												
95*:												
Hillon	C	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
95*:												
Yamac	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Fleak	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Moderate.
96, Hoffmanville	C	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
97, 98, Kremlin	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
99, Lehr	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
100, 101, Lisk	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
102, Lohler	C	None	---	---	4.0-6.0	Apparent	May-Aug	>60	---	Moderate	High	Low.
103, Lohler	C	Rare	---	---	4.0-6.0	Apparent	May-Aug	>60	---	Moderate	High	Low.
104, Lohler	C	None	---	---	4.0-6.0	Apparent	May-Aug	>60	---	Moderate	High	Low.
105, Lonna	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
106*:												
Lonna	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Havre	B	Occasional	Brief	Apr-Jun	>6.0	---	---	>60	---	Moderate	High	Low.
Glendive	B	Occasional	Brief	Apr-Jun	>6.0	---	---	>60	---	Low	High	Low.
107, 108, 109, Macar	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
110, Macar	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
111*:												
Macar	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
112*:												
Macar	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Cambert	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	Low.
113, Marias	D	None	---	---	>6.0	---	---	>60	---	Low	High	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
114---------- Marvan	D	None--------	---	---	>6.0	---	---	>60	---	Low-------	High------	Moderate.
115*: Neldore----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low-------	High------	Low.
Badland.												
115*: Bascovy----------	D	None--------	---	---	>6.0	---	---	20-40	Soft	Low-------	High------	High.
116*: Neldore----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low-------	High------	Low.
Bascovy----------	D	None--------	---	---	>6.0	---	---	20-40	Soft	Low-------	High------	High.
117*: Neldore----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low-------	High------	Low.
Yamac----------	B	None--------	---	---	>6.0	---	---	>60	---	Low-------	High------	Low.
Badland.												
118---------- Pendroy	D	None--------	---	---	>6.0	---	---	>60	---	Low-------	High------	Moderate.
119---------- Ridgelawn	B	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	High------	Low.
120, 121---------- Rominell	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High------	Low.
122*: Rominell---------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High------	Low.
Yamac----------	B	None--------	---	---	>6.0	---	---	>60	---	Low-------	High------	Low.
123---------- Savage	C	None--------	---	---	>6.0	---	---	>60	---	Low-------	High------	Low.
124, 125---------- Shambo	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
126*: Shambo----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Cabba----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	High------	Low.
127*: Shambo----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Cambert----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	High------	Low.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
128, 129, 130----- Sunburst	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
131, 132---------- Tally	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
133--------------- Telstad	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
134*, 135*:												
Telstad----------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Hillon-----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
136*:												
Telstad----------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Thoeny-----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
137--------------- Thoeny	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
138*:												
Thoeny-----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Absher-----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
139--------------- Trembles	B	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
140--------------- Trembles	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
141--------------- Turner	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
142*:												
Twilight---------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	Moderate	Low.
Yetull-----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
143. Typic Fluvaquents												
144. Typic Fluvaquents												
145. Typic Ustifluvents												
146*: Typic Ustorthents.												

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
146*: Typic Ustifluvents.												
147*: Ustic Torriorthents.												
Ustic Torrifluvents.												
148---------- Vanda	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
149, 150---------- Vida	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
151*, 152*: Vida----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Zahill----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
153, 154---------- Wabek	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
155---------- Weingart	D	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High-----	Moderate.
156, 157---------- Williams	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
158*: Williams----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Vida----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
159, 160, 161----- Yamac	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
162*: Yamac----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Twilight----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	Moderate	Low.
163*: Yamac----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Twilight----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	Moderate	Low.
Fleak----------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low------	Moderate	Moderate.
164---------- Yawdim	D	None--------	---	---	>6.0	---	---	10-20	Soft	Low------	High-----	Moderate.

See footnote at end of table.

TABLE 13.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
165*:												
Yawdim	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Moderate.
Badland.												
Cabbart	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
166*:												
Yawdim	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Moderate.
Badland.												
Gerdrum	C	None	---	---	>6.0	---	---	>60	---	Low	High	Moderate.
167*:												
Yawdim	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Moderate.
Kirby	A	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
168, 169, 170--- Zahill	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
171*:												
Zahill	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Badland.												
172*, 173*:												
Zahill	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Cabba	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	High	Low.
174*, 175*:												
Zahill	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Yawdim	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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
Absher	Fine, montmorillonitic Borollic Natrargids
*Adger	Fine, montmorillonitic Leptic Natriborolls
Alona	Fine-silty, mixed Borollic Camborthids
Banks	Sandy, mixed, frigid Typic Ustifluvents
Barkof	Fine, montmorillonitic, frigid Udorthentic Chromusterts
Bascovy	Fine, montmorillonitic, frigid Udorthentic Chromusterts
Benz	Fine-loamy, mixed (calcareous), frigid Ustic Torriorthents
Blanchard	Mixed, frigid Typic Ustipsamments
Bowbells	Fine-loamy, mixed Pachic Argiborolls
Brandenburg	Fragmental, mixed, frigid Typic Ustorthents
Bryant	Fine-silty, mixed Typic Haploborolls
Bryant Variant	Fine-silty, mixed Typic Haploborolls
Busby	Coarse-loamy, mixed Borollic Camborthids
Cabba	Loamy, mixed (calcareous), frigid, shallow Typic Ustorthents
Cabbart	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Cambert	Fine-silty, mixed, frigid Typic Ustochrepts
Cambeth	Fine-silty, mixed Borollic Camborthids
Cherry	Fine-silty, mixed, frigid Typic Ustochrepts
Chinook	Coarse-loamy, mixed Aridic Haploborolls
Creed	Fine, montmorillonitic Borollic Natrargids
Dast	Coarse-loamy, mixed (calcareous), frigid Typic Ustorthents
Dimmick	Fine, montmorillonitic, frigid Typic Haplaquolls
Ethridge	Fine, montmorillonitic Aridic Argiborolls
Evanston	Fine-loamy, mixed Aridic Argiborolls
Farland	Fine-silty, mixed Typic Argiborolls
Farnuf	Fine-loamy, mixed Typic Argiborolls
Fleak	Mixed, frigid, shallow Typic Torripsamments
Floweree	Fine-silty, mixed Aridic Haploborolls
Gerdrum	Fine, montmorillonitic Borollic Natrargids
Glendive	Coarse-loamy, mixed (calcareous), frigid Ustic Torrifluvents
Hanly	Sandy, mixed, frigid Ustic Torrifluvents
Harlem	Fine, montmorillonitic (calcareous), frigid Ustic Torrifluvents
Havre	Fine-loamy, mixed (calcareous), frigid Ustic Torrifluvents
Havrelon	Fine-loamy, mixed (calcareous), frigid Typic Ustifluvents
Hillon	Fine-loamy, mixed (calcareous), frigid Ustic Torriorthents
Hoffmanville	Clayey over sandy or sandy-skeletal, montmorillonitic (calcareous), frigid Typic Ustifluvents
Kirby	Fragmental, mixed (calcareous), frigid Ustic Torriorthents
Kremlin	Fine-loamy, mixed Aridic Haploborolls
Lehr	Fine-loamy over sandy or sandy-skeletal, mixed Typic Haploborolls
Lisk	Coarse-loamy, mixed, frigid Typic Ustochrepts
Lohler	Fine, montmorillonitic (calcareous), frigid Typic Ustifluvents
Lonna	Fine-silty, mixed Borollic Camborthids
Macar	Fine-loamy, mixed, frigid Typic Ustochrepts
Marias	Fine, montmorillonitic, frigid Udorthentic Chromusterts
Marvan	Fine, montmorillonitic, frigid Udorthentic Chromusterts
Neldore	Clayey, montmorillonitic, nonacid, frigid, shallow Ustic Torriorthents
Pendroy	Very-fine, montmorillonitic, frigid Udorthentic Chromusterts
Ridgelawn	Fine-loamy over sandy or sandy-skeletal, mixed (calcareous), frigid Typic Ustifluvents
Rominell	Fine-loamy, mixed Borollic Natrargids
Savage	Fine, montmorillonitic Typic Argiborolls
Shambo	Fine-loamy, mixed Typic Haploborolls
Sunburst	Fine, montmorillonitic (calcareous), frigid Ustic Torriorthents
Tally	Coarse-loamy, mixed Typic Haploborolls
Telstad	Fine-loamy, mixed Aridic Argiborolls
*Thoeny	Fine, montmorillonitic Borollic Natrargids
Trembles	Coarse-loamy, mixed (calcareous), frigid Typic Ustifluvents
Turner	Fine-loamy over sandy or sandy-skeletal, mixed Typic Argiborolls
Twilight	Coarse-loamy, mixed Borollic Camborthids
Vanda	Fine, montmorillonitic (calcareous), frigid Ustic Torriorthents
Vida	Fine-loamy, mixed Typic Argiborolls
Wabek	Sandy-skeletal, mixed Entic Haploborolls
Weingart	Fine, montmorillonitic Borollic Natrargids
Williams	Fine-loamy, mixed Typic Argiborolls
Yamac	Fine-loamy, mixed Borollic Camborthids
Yawdim	Clayey, montmorillonitic (calcareous), frigid, shallow Ustic Torriorthents
Yetull	Mixed, frigid Ustic Torripsamments
Zahill	Fine-loamy, mixed (calcareous), frigid Typic Ustorthents

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