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IOWA STATE UNIVERSITY
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In cooperation with Iowa Agriculture and Home Economics Experiment Station and Cooperative Extension Service, Iowa State University, and Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship

Soil Survey of Cass County, Iowa

Part II

How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the general soil map units, detailed soil map units, and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

On the **general soil map**, the survey area is divided into groups of soils called associations. This map is useful in planning the use and management of large areas.

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

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

To find information about your area of interest, locate that area on the **Index to Map Sheets** in Part III. Note the number of the map sheet, and turn to that sheet. Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. The **Contents** in Part I lists the map units and shows the page where each map unit is described.

The **Contents** in Part II shows which table has information on a specific land use or soil property for each detailed soil map unit. Also, see the **Contents** in Part I and Part II for other sections of this publication that may address your specific needs.

National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service; the Iowa Agriculture and Home Economics Experiment Station and Cooperative Extension Service, Iowa State University; and the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship. The survey is part of the technical assistance furnished to the Cass County Soil and Water Conservation District.

Major fieldwork for this soil survey was completed in 2010. Soil names and descriptions were approved in 2010. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2010. The tables reflect the data in effect as of February 2011. The most current official data are available on the Internet (http://soils.usda.gov).

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

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Cover Photo Caption

Corn growing on an upland in an area of the Sharpsburg-Shelby association in Cass County, Iowa.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Soil Survey of
Cass County, Iowa

Introduction to Part II

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

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

This part of the soil survey includes interpretations for various uses of the soils and data on soil properties. This information can be used to plan the use and management of soils for crops and pasture or as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational 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.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in 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 gravel, sand, reclamation material, 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.

The table “Classification of the Soils” is at the end of this section. Information about the system of soil taxonomy used by the Natural Resources Conservation Service is available in Part I of this publication. The extent of the map units in this survey area is shown in the table “Acreage and Proportionate Extent of the Soils.”

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text in Part I for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ackmore	Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents
*Adair	Fine, smectitic, mesic Oxyaquic Vertic Hapludalfs
Ankeny	Coarse-loamy, mixed, superactive, mesic Cumulic Hapludolls
Bremer	Fine, smectitic, mesic Typic Argiaquolls
Calco	Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls
Clarinda	Fine, smectitic, mesic Vertic Argiaquolls
*Clarinda	Fine, smectitic, mesic Vertic Epiaqualfs
*Clarinda	Fine, smectitic, mesic Chromic Vertic Epiaqualfs
*Clearfield	Fine, smectitic, mesic Vertic Endoaqualfs
Colo	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Corley	Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls
*Dickman	Sandy, mixed, mesic Dystric Eutrudepts
Ely	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
*Exira	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
*Hesch	Coarse-loamy, mixed, active, mesic Mollic Hapludalfs
Humeston	Fine, smectitic, mesic Argiaquic Argialbolls
Judson	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Kennebec	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
*Lamoni	Fine, smectitic, mesic Vertic Epiaqualfs
*Lamoni	Fine, smectitic, mesic Chromic Vertic Epiaqualfs
Marshall	Fine-silty, mixed, superactive, mesic Typic Hapludolls
*Marshall	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Melia	Fine-silty, mixed, superactive, mesic Pachic Hapludolls
Minden	Fine-silty, mixed, superactive, mesic Aquic Hapludolls
Mt. Sterling	Fine-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents
Nevin	Fine-silty, mixed, superactive, mesic Aquic Pachic Argiudolls
*Nira	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs
Nodaway	Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Olmitz	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Sharpsburg	Fine, smectitic, mesic Typic Argiudolls
*Sharpsburg	Fine, smectitic, mesic Mollic Hapludalfs
Shelby	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
*Shelby	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
*Shelby	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Vesser	Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls
Wabash	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Wiota	Fine-silty, mixed, superactive, mesic Pachic Argiudolls
Zook	Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
7	Wiota silty clay loam, 0 to 2 percent slopes, rarely flooded	413	0.1
7B	Wiota silty clay loam, 2 to 5 percent slopes, rarely flooded	67	*
9	Marshall silty clay loam, 0 to 2 percent slopes	2,051	0.6
9B	Marshall silty clay loam, 2 to 5 percent slopes	29,301	8.1
9C2	Marshall silty clay loam, 5 to 9 percent slopes, moderately eroded	29,465	8.1
9C3	Marshall silty clay loam, 5 to 9 percent slopes, severely eroded	863	0.2
9D2	Marshall silty clay loam, 9 to 14 percent slopes, moderately eroded	168	*
15B	Olmitz-Ely-Zook complex, 2 to 5 percent slopes	8	*
16	Nodaway-Kennebec complex, 0 to 2 percent slopes, occasionally flooded	4,138	1.1
43	Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded	1,189	0.3
54	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	10,293	2.8
54+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	6,176	1.7
88	Nevin silty clay loam, 0 to 2 percent slopes, rarely flooded	2,788	0.8
99D2	Exira silty clay loam, 9 to 14 percent slopes, moderately eroded	45,187	12.5
99D3	Exira silty clay loam, 9 to 14 percent slopes, severely eroded	3,427	0.9
99E2	Exira silty clay loam, 14 to 18 percent slopes, moderately eroded	3,918	1.1
99E3	Exira silty clay loam, 14 to 18 percent slopes, severely eroded	1,254	0.3
113B	Colo, overwash-Ely complex, 2 to 5 percent slopes	21,043	5.8
136	Ankeny fine sandy loam, 0 to 2 percent slopes, occasionally flooded	99	*
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	2,683	0.7
220	Nodaway silt loam, 0 to 2 percent slopes, occasionally flooded	12,345	3.4
229C2	Clarinda, moderately eroded-Clarinda, severely eroded, complex, 5 to 9 percent slopes	147	*
229D2	Clarinda, moderately eroded-Clarinda, severely eroded, complex, 9 to 14 percent slopes	1,194	0.3
247D2	Shelby, sandy substratum-Hesch, deep-Hesch complex, 9 to 14 percent slopes, moderately eroded	92	*
269	Humeston silty clay loam, 0 to 2 percent slopes, occasionally flooded	169	*
273B	Olmitz loam, 2 to 5 percent slopes	175	*
289D2	Dickman, loamy substratum-Marshall complex, 9 to 14 percent slopes, moderately eroded	401	0.1
300	Bremer silty clay loam, 0 to 2 percent slopes	346	*
337D2	Dickman, loamy substratum-Sharpsburg complex, 9 to 14 percent slopes, moderately eroded	24	*
370	Sharpsburg silty clay loam, 0 to 2 percent slopes	1,794	0.5
370B	Sharpsburg silty clay loam, 2 to 5 percent slopes	14,153	3.9
371C2	Sharpsburg-Nira complex, 5 to 9 percent slopes, moderately eroded	20,544	5.7
371D2	Sharpsburg-Nira complex, 9 to 14 percent slopes, moderately eroded	15,857	4.4
371E2	Sharpsburg-Nira complex, 14 to 18 percent slopes, moderately eroded	1,141	0.3
430	Ackmore silt loam, 0 to 2 percent slopes, occasionally flooded	48	*
431B	Judson-Ackmore-Colo, overwash, complex, 1 to 5 percent slopes	35,781	9.9
435	Zook-Mt. Sterling complex, 0 to 2 percent slopes, occasionally flooded	241	*
469C2	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, moderately eroded	1	*
469C3	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, severely eroded	1	*

See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
470D2	Lamoni-Shelby complex, 9 to 14 percent slopes, moderately eroded	4,985	1.4
509B	Marshall silty clay loam, terrace, 2 to 5 percent slopes	3,623	1.0
509C	Marshall silty clay loam, terrace, 5 to 9 percent slopes	1	*
509C2	Marshall silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	1,574	0.4
545B	Zook-Ely-Gullied land complex, 2 to 5 percent slopes	4,198	1.2
733	Calco silty clay loam, 0 to 2 percent slopes, occasionally flooded	98	*
803	Melia silty clay loam, terrace, 0 to 2 percent slopes	3,183	0.9
824E3	Shelby-Lamoni complex, 14 to 18 percent slopes, severely eroded	1,477	0.4
870B	Sharpsburg silty clay loam, terrace, 1 to 5 percent slopes	93	*
1239	Corley-Minden complex, terrace, 0 to 2 percent slopes	999	0.3
2428	Ely-Colo, overwash-Mt. Sterling complex, 0 to 2 percent slopes	3,128	0.9
4946C	Udorthents-Highway complex, 0 to 9 percent slopes	1,236	0.3
5030	Pits, limestone quarries	245	*
5040	Udorthents, loamy	701	0.2
5080	Udorthents, sanitary landfill	52	*
AW	Animal waste lagoon	19	*
SL	Sewage lagoon	34	*
W	Water	1,422	0.4
Y8B	Judson silty clay loam, MLRA 108D, 2 to 5 percent slopes	2,908	0.8
Y8C	Judson silty clay loam, MLRA 108D, 5 to 9 percent slopes	208	*
Y24C2	Shelby clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	291	*
Y24D2	Shelby clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	2,459	0.7
Y24D3	Shelby clay loam, MLRA 108D, 9 to 14 percent slopes, severely eroded	862	0.2
Y24E	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes	8	*
Y24E2	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes, moderately eroded	5,876	1.6
Y24E3	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes, severely eroded	1,200	0.3
Y24F2	Shelby clay loam, MLRA 108D, 18 to 25 percent slopes, moderately eroded	1,195	0.3
Y24F3	Shelby clay loam, MLRA 108D, 18 to 25 percent slopes, severely eroded	400	0.1
Y82C3	Adair-Shelby complex, MLRA 108D, 5 to 9 percent slopes, severely eroded	197	*
Y93D2	Shelby-Adair complex, MLRA 108D, 9 to 14 percent slopes, moderately eroded	779	0.2
Y93D3	Shelby-Adair complex, MLRA 108D, 9 to 14 percent slopes, severely eroded	2,191	0.6
Y93E2	Shelby-Adair complex, MLRA 108D, 14 to 18 percent slopes, moderately eroded	241	*
Y192C2	Adair clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	989	0.3
Y192D2	Adair clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	6,123	1.7
Y222C2	Clarinda silty clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	910	0.3
Y222D2	Clarinda silty clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	1,174	0.3
Y222D3	Clarinda silty clay loam, MLRA 108D, 9 to 14 percent slopes, severely eroded	9	*
Z8B	Judson silty clay loam, MLRA 107B, 2 to 5 percent slopes	11,517	3.2
Z8C	Judson silty clay loam, MLRA 107B, 5 to 9 percent slopes	279	*
Z24D2	Shelby clay loam, MLRA 107B, 9 to 14 percent slopes, moderately eroded	2,865	0.8
Z24D3	Shelby clay loam, MLRA 107B, 9 to 14 percent slopes, severely eroded	362	0.1
Z24E2	Shelby clay loam, MLRA 107B, 14 to 18 percent slopes, moderately eroded	2,936	0.8
Z24E3	Shelby clay loam, MLRA 107B, 14 to 18 percent slopes, severely eroded	3,971	1.1
Z24F2	Shelby clay loam, MLRA 107B, 18 to 25 percent slopes, moderately eroded	791	0.2
Z82D3	Adair-Shelby complex, MLRA 107B, 9 to 14 percent slopes, severely eroded	13,203	3.7
Z93C2	Shelby-Adair complex, MLRA 107B, 5 to 9 percent slopes, moderately eroded	1,128	0.3
Z93D2	Shelby-Adair complex, MLRA 107B, 9 to 14 percent slopes, moderately eroded	12	*
Z93E2	Shelby-Adair complex, MLRA 107B, 14 to 18 percent slopes, moderately eroded	341	*
Z192C3	Adair clay loam, MLRA 107B, 5 to 9 percent slopes, severely eroded	220	*
Z222D2	Clarinda silty clay loam, MLRA 107B, 9 to 14 percent slopes, moderately eroded	2	*
	Total	361,700	100.0

* Less than 0.1 percent.

Agronomy

This section provides some general information about managing the soils for crops and for hay and pasture. The Iowa corn suitability rating system and the system of land capability classification used by the Natural Resources Conservation Service are explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil. Prime farmland and other categories of important farmland are described, and interpretations for windbreaks and environmental plantings and for agricultural waste management are provided.

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Cropland Management Considerations

The main concerns in managing nonirrigated cropland in the survey area are conserving moisture, controlling wind erosion and water erosion, and maintaining soil fertility.

Conserving moisture consists primarily of reducing the evaporation and runoff rates and increasing the water infiltration rate. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Erosion is the main cause of a decrease in the content of organic matter in soils. Although it is generally not possible to increase the content of organic matter to the level that was characteristic of the native grassland, measures that control erosion can keep the content of organic matter at an acceptable level for crop growth.

Important changes took place when Cass County was settled. Breaking the prairie sod and clearing the timber removed and changed the protective plant cover. Changes caused by water erosion generally were the most significant. As the land was brought under cultivation, the runoff rate increased and the rate at which water moved into the soil decreased. As a result, accelerated erosion removed part or all of the original surface layer from many of the more sloping soils. In some areas, shallow to deep gullies have formed.

Cultivation and erosion also changed the structure and consistence of the surface layer of some soils and the content of organic matter and level of fertility. In severely eroded areas, the plow layer commonly includes the upper part of the subsoil, which is less friable and finer textured than the surface layer. Even in areas that are not subject to erosion, compaction by heavy machinery reduces the thickness of the surface layer and changes the soil structure. The granular structure of native grassland soil breaks down when these areas are intensively cropped.

Some management measures reduce the susceptibility to erosion, increase soil productivity, and reclaim areas not suitable for crops or pasture. For example, a large area of bottom land is suitable for cultivation because flooding and deposition are

controlled by diversions at the base of slopes, drainage ditches, and surface drains. In some areas, erosion and runoff are controlled by terraces and filter strips

Generally, a combination of several practices is needed to control wind erosion and water erosion. Conservation tillage, stripcropping, field windbreaks, contour farming, conservation cropping systems, crop residue management, terraces, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in maintaining soil fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer. Many soils are more productive than they were in their natural state because applications of commercial fertilizer and lime have overcome deficiencies in plant nutrients.

Crop Yield Estimates

The tables “Land Capability, Corn Suitability Rating, and Yields per Acre of Crops” and “Land Capability and Yields per Acre of Pasture” are described in this section. Crops other than those shown in the tables are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, or wildlife habitat.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

[Reference: United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. USDA Handbook 210.]

Corn Suitability Rating

The corn suitability rating (CSR) system was developed in Iowa to rate the productivity of each different kind of soil for row crops. CSRs provide a relative ranking of all soils mapped in the State of Iowa. They can be used to compare the potential yield production of one soil with that of other soils. Ratings range from 5 to 100. A rating of 5 indicates severe limitations for row crop production. Soil properties and weather conditions are the dominant factors that affect productivity.

Crop Yields

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the table. 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 also are considered.

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

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is

developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Pasture Yields

Some pasture yields are expressed in the table in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about forage yields other than those shown in the table.

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops

(The crop yield estimates are based on a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. See text for additional information)

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
7 Wiota, rarely flooded	85	1	93	211	71	116
7B Wiota, rarely flooded	85	2e	89	206	69	113
9 Marshall	90	1	88	205	69	112
9B Marshall	100	2e	85	200	67	110
9C2 Marshall, moderately eroded	80	3e	77	190	64	104
9C3 Marshall, severely eroded	80	4e	72	183	61	101
9D2 Marshall, moderately eroded	70	3e	52	156	52	86
15B			74	186	62	102
Olmitz	35	2e				
Ely	30	2e				
Zook	20	2w				
16			78	191	64	105
Nodaway, occasionally flooded	55	2w				
Kennebec, occasionally flooded	35	1				
43 Bremer, rarely flooded	80	2w	70	180	60	99
54 Zook, occasionally flooded	90	2w	59	165	55	91
54+ Zook, occasionally flooded, overwash	80	2w	63	171	57	94
88 Nevin, rarely flooded	90	1	88	205	69	112
99D2 Exira, moderately eroded	65	3e	53	157	53	86
99D3 Exira, severely eroded	75	4e	47	149	50	82

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
99E2 Exira, moderately eroded	75	4e	44	145	49	80
99E3 Exira, severely eroded	80	4e	37	136	45	75
113B			59	165	55	91
Colo, frequently flooded, overwash	50	2w				
Ely	25	2e				
136 Ankeny, occasionally flooded	95	2s	59	165	55	91
212 Kennebec, occasionally flooded	70	1	83	198	66	109
220 Nodaway, occasionally flooded	75	2w	74	186	62	102
229C2			56	161	54	89
Clarinda, moderately eroded	40	4e				
Clarinda, severely eroded	20	6e				
229D2			29	125	42	69
Clarinda, moderately eroded	55	4e				
Clarinda, severely eroded	20	6e				
247D2			34	132	44	72
Shelby, sandy substratum, moderately eroded	35	3e				
Hesch, deep, moderately eroded	25	6e				
Hesch, moderately eroded	20	6e				
269 Humeston, occasionally flooded, occasionally ponded	100	3w	40	140	47	77
273B Olmitz	80	2e	79	192	64	106
289D2			26	121	40	66
Dickman, loamy substratum, moderately eroded	35	4e				
Marshall, moderately eroded	30	3e				
300 Bremer, terrace	90	2w	71	182	61	100

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
337D2			29	125	42	69
Dickman, loamy substratum, moderately eroded	45	4e				
Sharpsburg, moderately eroded	40	3e				
370	95	1	85	200	67	110
Sharpsburg						
370B	80	2e	80	194	65	107
Sharpsburg						
371C2			69	179	60	98
Sharpsburg, moderately eroded	65	3e				
Nira, moderately eroded	30	3e				
371D2			47	149	50	82
Sharpsburg	45	3e				
Sharpsburg, moderately eroded	20	3e				
Nira, moderately eroded	20	3e				
371E2			33	130	44	72
Sharpsburg, moderately eroded	55	4e				
Nira, moderately eroded	10	4e				
430	75	2w	71	182	61	100
Ackmore, occasionally flooded						
431B			73	184	62	101
Judson	50	2e				
Ackmore, rarely flooded	25	2w				
Colo, frequently flooded, overwash	15	2w				
435			64	172	58	95
Zook, occasionally flooded	40	2w				
Mt. Sterling, occasionally flooded	35	2w				
469C2			58	164	55	90
Lamoni, moderately eroded	35	3e				
Clarinda, moderately eroded	30	4w				
Shelby, moderately eroded	20	3e				
469C3			53	157	53	86
Lamoni, severely eroded	35	4e				
Clarinda, severely eroded	30	6e				
Shelby, severely eroded	20	3e				

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
470D2			35	133	45	73
Lamoni, moderately eroded	35	4e				
Shelby, moderately eroded	25	3e				
509B	90	2e	84	199	67	110
Marshall, terrace						
509C	90	3e	81	195	65	107
Marshall, terrace						
509C2	95	3e	77	190	64	104
Marshall, terrace, moderately eroded						
545B			57	163	54	89
Zook	35	2w				
Ely	30	1				
Gullied land	20	---				
733	90	2w	72	183	61	101
Calco, occasionally flooded						
803	90	1	94	213	71	117
Melia, terrace						
824E3			23	117	39	64
Shelby, severely eroded	50	6e				
Lamoni, severely eroded	30	7e				
870B	85	2e	80	194	65	107
Sharpsburg, terrace						
1239			69	179	60	98
Corley, terrace	60	2w				
Minden, terrace	30	1				
2428			73	184	62	101
Ely	45	1				
Colo, overwash	25	2w				
Mt. Sterling	20	2w				
4946C. Udorthents-Interstate highway						
5030. Pits, limestone quarry						
5040. Udorthents, loamy						
5080. Udorthents, sanitary landfill						
AW. Animal waste lagoon						
SL. Sewage lagoon						

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
W. Water						
Y8B Judson	85	2e	85	200	67	110
Y8C Judson	85	2e	81	195	65	107
Y24C2 Shelby, moderately eroded	60	3e	68	178	59	98
Y24D2 Shelby, moderately eroded	65	3e	42	142	48	78
Y24D3 Shelby, severely eroded	55	4e	39	138	46	76
Y24E Shelby	60	4e	37	136	45	75
Y24E2 Shelby, moderately eroded	55	4e	30	126	42	69
Y24E3 Shelby, severely eroded	65	6e	27	122	41	67
Y24F2 Shelby, moderately eroded	50	6e	16	107	36	59
Y24F3 Shelby, severely eroded	55	6e	15	106	35	58
Y82C3			46	148	50	81
Adair, severely eroded	60	4e				
Shelby, severely eroded	25	3e				
Y93D2			35	133	45	73
Shelby, moderately eroded	35	3e				
Adair, moderately eroded	25	4e				
Y93D3			31	128	43	70
Shelby, severely eroded	35	4e				
Adair, severely eroded	30	6e				
Y93E2			24	118	40	65
Shelby, moderately eroded	40	4e				
Adair, moderately eroded	30	6e				
Y192C2 Adair, moderately eroded	65	3e	52	156	52	86
Y192D2 Adair, moderately eroded	55	4e	28	124	41	68

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
Y222C2 Clarinda, moderately eroded	75	4w	51	155	52	85
Y222D2 Clarinda, moderately eroded	60	4e	27	122	41	67
Y222D3 Clarinda, severely eroded	70	6e	24	118	40	65
Z8B Judson	80	2e	83	198	66	109
Z8C Judson	75	3e	81	195	65	107
Z24D2 Shelby, moderately eroded	55	3e	44	145	49	80
Z24D3 Shelby, severely eroded	85	4e	40	140	47	77
Z24E2 Shelby, moderately eroded	50	4e	29	125	42	69
Z24E3 Shelby, severely eroded	55	6e	26	121	40	66
Z24F2 Shelby, moderately eroded	60	6e	17	109	36	60
Z82D3			31	128	43	70
Adair, severely eroded	35	6e				
Shelby, severely eroded	30	4e				
Z93C2			60	167	56	92
Shelby, moderately eroded	40	3e				
Adair, moderately eroded	35	4e				
Z93D2			42	142	48	78
Shelby, moderately eroded	65	3e				
Adair, moderately eroded	20	4e				
Z93E2			26	121	40	66
Shelby, moderately eroded	45	4e				
Adair, moderately eroded	35	6e				
Z192C3 Adair, severely eroded	55	4e	50	153	51	84
Z222D2 Clarinda, moderately eroded	70	4e	28	124	41	68

Land Capability and Yields per Acre of Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
7 Wiota, rarely flooded	1	8.0	6.7	4.0	6.4
7B Wiota, rarely flooded	2e	7.8	6.5	3.9	6.2
9 Marshall	1	7.8	6.5	3.8	6.2
9B Marshall	2e	7.6	6.4	3.8	6.0
9C2 Marshall, moderately eroded	3e	7.2	6.0	3.6	5.7
9C3 Marshall, severely eroded	4e	6.9	5.8	3.4	5.5
9D2 Marshall, moderately eroded	3e	5.9	5.0	2.9	4.7
15B		7.0	5.9	3.5	5.6
Olmitz	2e				
Ely	2e				
Zook	2w				
16		7.2	6.1	3.6	5.8
Nodaway, occasionally flooded	2w				
Kennebec, occasionally flooded	1				
43 Bremer, rarely flooded	2w	6.8	5.7	3.4	5.4
54 Zook, occasionally flooded	2w	6.3	5.3	3.1	5.0
54+ Zook, occasionally flooded, overwash	2w	6.5	5.4	3.2	5.2
88 Nevin, rarely flooded	1	7.8	6.5	3.8	6.2
99D2 Exira, moderately eroded	3e	6.0	5.0	2.9	4.7

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
99D3 Exira, severely eroded	4e	5.7	4.7	2.8	4.5
99E2 Exira, moderately eroded	4e	5.5	4.6	2.7	4.4
99E3 Exira, severely eroded	4e	5.1	4.3	2.5	4.1
113B Colo, frequently flooded, overwash	2w	6.3	5.3	3.1	5.0
Ely	2e				
136 Ankeny, occasionally flooded	2s	6.3	5.3	3.1	5.0
212 Kennebec, occasionally flooded	1	7.5	6.3	3.7	6.0
220 Nodaway, occasionally flooded	2w	7.0	5.9	3.5	5.6
229C2 Clarinda, moderately eroded	4e	6.1	5.1	3.0	4.9
Clarinda, severely eroded	6e				
229D2 Clarinda, moderately eroded	4e	4.7	4.0	2.3	3.8
Clarinda, severely eroded	6e				
247D2 Shelby, sandy substratum, moderately eroded	3e	5.0	4.2	2.5	4.0
Hesch, deep, moderately eroded	6e				
Hesch, moderately eroded	6e				
269 Humeston, occasionally flooded, occasionally ponded	3w	5.3	4.4	2.6	4.2
273B Olmitz	2e	7.3	6.1	3.6	5.8
289D2 Dickman, loamy substratum, moderately eroded	4e	4.6	3.8	2.3	3.6
Marshall, moderately eroded	3e				

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
300 Bremer, terrace	2w	6.9	5.8	3.4	5.5
337D2 Dickman, loamy substratum, moderately eroded	4e	4.7	4.0	2.3	3.8
Sharpsburg, moderately eroded	3e				
370 Sharpsburg	1	7.6	6.4	3.8	6.0
370B Sharpsburg	2e	7.3	6.2	3.6	5.8
371C2 Sharpsburg, moderately eroded	3e	6.8	5.7	3.4	5.4
Nira, moderately eroded	3e				
371D2 Sharpsburg	3e	5.7	4.7	2.8	4.5
Sharpsburg, moderately eroded	3e				
Nira, moderately eroded	3e				
371E2 Sharpsburg, moderately eroded	4e	4.9	4.1	2.4	3.9
Nira, moderately eroded	4e				
430 Ackmore, occasionally flooded	2w	6.9	5.8	3.4	5.5
431B Judson	2e	7.0	5.9	3.5	5.6
Ackmore, rarely flooded	2w				
Colo, frequently flooded, overwash	2w				
435 Zook, occasionally flooded	2w	6.5	5.5	3.2	5.2
Mt. Sterling, occasionally flooded	2w				
469C2 Lamoni, moderately eroded	3e	6.2	5.2	3.1	4.9
Clarinda, moderately eroded	4w				
Shelby, moderately eroded	3e				

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
469C3		6.0	5.0	2.9	4.7
Lamoni, severely eroded	4e				
Clarinda, severely eroded	6e				
Shelby, severely eroded	3e				
470D2		5.0	4.2	2.5	4.0
Lamoni, moderately eroded	4e				
Shelby, moderately eroded	3e				
509B	2e	7.5	6.3	3.7	6.0
Marshall, terrace					
509C	3e	7.4	6.2	3.7	5.9
Marshall, terrace					
509C2	3e	7.2	6.0	3.6	5.7
Marshall, terrace, moderately eroded					
545B		6.2	5.2	3.0	4.9
Zook	2w				
Ely	1				
Gullied land	---				
733	2w	6.9	5.8	3.4	5.5
Calco, occasionally flooded					
803	1	8.1	6.8	4.0	6.4
Melia, terrace					
824E3		4.4	3.7	2.2	3.5
Shelby, severely eroded	6e				
Lamoni, severely eroded	7e				
870B	2e	7.3	6.2	3.6	5.8
Sharpsburg, terrace					
1239		6.8	5.7	3.4	5.4
Corley, terrace	2w				
Minden, terrace	1				
2428		7.0	5.9	3.5	5.6
Ely	1				
Colo, overwash	2w				
Mt. Sterling	2w				
4946C.					
Udorthents-Interstate highway					
5030.					
Pits, limestone quarry					
5040.					
Udorthents, loamy					

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
5080. Udorthents, sanitary landfill					
AW. Animal waste lagoon					
SL. Sewage lagoon					
W. Water					
Y8B Judson	2e	7.6	6.4	3.8	6.0
Y8C Judson	2e	7.4	6.2	3.7	5.9
Y24C2 Shelby, moderately eroded	3e	6.7	5.6	3.3	5.4
Y24D2 Shelby, moderately eroded	3e	5.4	4.5	2.7	4.3
Y24D3 Shelby, severely eroded	4e	5.2	4.4	2.6	4.2
Y24E Shelby	4e	5.1	4.3	2.5	4.1
Y24E2 Shelby, moderately eroded	4e	4.8	4.0	2.4	3.8
Y24E3 Shelby, severely eroded	6e	4.6	3.9	2.3	3.7
Y24F2 Shelby, moderately eroded	6e	4.1	3.4	2.0	3.2
Y24F3 Shelby, severely eroded	6e	4.0	3.4	2.0	3.2
Y82C3		5.6	4.7	2.8	4.5
Adair, severely eroded	4e				
Shelby, severely eroded	3e				
Y93D2		5.0	4.2	2.5	4.0
Shelby, moderately eroded	3e				
Adair, moderately eroded	4e				
Y93D3		4.8	4.1	2.4	3.8
Shelby, severely eroded	4e				
Adair, severely eroded	6e				

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
Y93E2 Shelby, moderately eroded Adair, moderately eroded	4e 6e	4.5	3.8	2.2	3.6
Y192C2 Adair, moderately eroded	3e	5.9	5.0	2.9	4.7
Y192D2 Adair, moderately eroded	4e	4.7	3.9	2.3	3.7
Y222C2 Clarinda, moderately eroded	4w	5.9	4.9	2.9	4.7
Y222D2 Clarinda, moderately eroded	4e	4.6	3.9	2.3	3.7
Y222D3 Clarinda, severely eroded	6e	4.5	3.8	2.2	3.6
Z8B Judson	2e	7.5	6.3	3.7	6.0
Z8C Judson	3e	7.4	6.2	3.7	5.9
Z24D2 Shelby, moderately eroded	3e	5.5	4.6	2.7	4.4
Z24D3 Shelby, severely eroded	4e	5.3	4.4	2.6	4.2
Z24E2 Shelby, moderately eroded	4e	4.7	4.0	2.3	3.8
Z24E3 Shelby, severely eroded	6e	4.6	3.8	2.3	3.6
Z24F2 Shelby, moderately eroded	6e	4.1	3.5	2.0	3.3
Z82D3 Adair, severely eroded Shelby, severely eroded	6e 4e	4.8	4.1	2.4	3.8
Z93C2 Shelby, moderately eroded Adair, moderately eroded	3e 4e	6.3	5.3	3.1	5.0
Z93D2 Shelby, moderately eroded Adair, moderately eroded	3e 4e	5.4	4.5	2.7	4.3

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capability	Bromegrass-alfalfa	Bromegrass-alfalfa hay	Kentucky bluegrass	Smooth bromegrass
		AUM*	Tons	AUM*	AUM*
Z93E2 Shelby, moderately eroded	4e	4.6	3.8	2.3	3.6
Adair, moderately eroded	6e				
Z192C3 Adair, severely eroded	4e	5.8	4.9	2.9	4.6
Z222D2 Clarinda, moderately eroded	4e	4.7	3.9	2.3	3.7

* Animal unit month: The amount of forage required to feed one mature cow, of approximately 1,000 pounds weight, with or without a calf, for 30 days.

Prime Farmland and Other Important Farmland

The table “Prime Farmland and Other Important Farmland” lists the map units in the survey area that are considered prime farmland and farmland of statewide importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

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

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

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

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

In some areas, land that does not meet the criteria for prime farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Prime Farmland and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, such as "where drained," these conditions are specified)

Map symbol	Map unit name	Farmland classification
7	Wiota silty clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland
7B	Wiota silty clay loam, 2 to 5 percent slopes, rarely flooded	Prime farmland
9	Marshall silty clay loam, 0 to 2 percent slopes	Prime farmland
9B	Marshall silty clay loam, 2 to 5 percent slopes	Prime farmland
9C2	Marshall silty clay loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
9C3	Marshall silty clay loam, 5 to 9 percent slopes, severely eroded	Farmland of statewide importance
9D2	Marshall silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
15B	Olmitz-Ely-Zook complex, 2 to 5 percent slopes	Prime farmland where drained
16	Nodaway-Kennebec complex, 0 to 2 percent slopes, occasionally flooded	Prime farmland
43	Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland where drained
54	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
54+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland where drained
88	Nevin silty clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland
99D2	Exira silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
99D3	Exira silty clay loam, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
99E2	Exira silty clay loam, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
99E3	Exira silty clay loam, 14 to 18 percent slopes, severely eroded	Farmland of statewide importance
113B	Colo, overwash-Ely complex, 2 to 5 percent slopes	Prime farmland where drained
136	Ankeny fine sandy loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
220	Nodaway silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
229C2	Clarinda, moderately eroded-Clarinda, severely eroded, complex, 5 to 9 percent slopes	Farmland of statewide importance
229D2	Clarinda, moderately eroded-Clarinda, severely eroded, complex, 9 to 14 percent slopes	Farmland of statewide importance
247D2	Shelby, sandy substratum-Hesch, deep-Hesch complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
269	Humeston silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
273B	Olmitz loam, 2 to 5 percent slopes	Prime farmland
289D2	Dickman, loamy substratum-Marshall complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
300	Bremer silty clay loam, 0 to 2 percent slopes	Prime farmland where drained
337D2	Dickman, loamy substratum-Sharpsburg complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
370	Sharpsburg silty clay loam, 0 to 2 percent slopes	Prime farmland
370B	Sharpsburg silty clay loam, 2 to 5 percent slopes	Prime farmland
371C2	Sharpsburg-Nira complex, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
371D2	Sharpsburg-Nira complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
371E2	Sharpsburg-Nira complex, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance

Prime Farmland and Other Important Farmland--Continued

Map symbol	Map unit name	Farmland classification
430	Ackmore silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
431B	Judson-Ackmore-Colo, overwash, complex, 1 to 5 percent slopes	Prime farmland where drained
435	Zook-Mt. Sterling complex, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
469C2	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
469C3	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, severely eroded	Farmland of statewide importance
470D2	Lamoni-Shelby complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
509B	Marshall silty clay loam, terrace, 2 to 5 percent slopes	Prime farmland
509C	Marshall silty clay loam, terrace, 5 to 9 percent slopes	Farmland of statewide importance
509C2	Marshall silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
545B	Zook-Ely-Gullied land complex, 2 to 5 percent slopes	Prime farmland where drained
733	Calco silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
803	Melia silty clay loam, terrace, 0 to 2 percent slopes	Prime farmland
824E3	Shelby-Lamoni complex, 14 to 18 percent slopes, severely eroded	Farmland of statewide importance
870B	Sharpsburg silty clay loam, terrace, 1 to 5 percent slopes	Prime farmland
1239	Corley-Minden complex, terrace, 0 to 2 percent slopes	Prime farmland where drained
2428	Ely-Colo, overwash-Mt. Sterling complex, 0 to 2 percent slopes	Prime farmland where drained
Y8B	Judson silty clay loam, MLRA 108D, 2 to 5 percent slopes	Prime farmland
Y8C	Judson silty clay loam, MLRA 108D, 5 to 9 percent slopes	Farmland of statewide importance
Y24C2	Shelby clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
Y24D2	Shelby clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Y24D3	Shelby clay loam, MLRA 108D, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
Y24E	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes	Farmland of statewide importance
Y24E2	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
Y24E3	Shelby clay loam, MLRA 108D, 14 to 18 percent slopes, severely eroded	Farmland of statewide importance
Y24F2	Shelby clay loam, MLRA 108D, 18 to 25 percent slopes, moderately eroded	Farmland of statewide importance
Y24F3	Shelby clay loam, MLRA 108D, 18 to 25 percent slopes, severely eroded	Farmland of statewide importance
Y82C3	Adair-Shelby complex, MLRA 108D, 5 to 9 percent slopes, severely eroded	Farmland of statewide importance
Y93D2	Shelby-Adair complex, MLRA 108D, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Y93D3	Shelby-Adair complex, MLRA 108D, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
Y93E2	Shelby-Adair complex, MLRA 108D, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
Y192C2	Adair clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
Y192D2	Adair clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Y222C2	Clarinda silty clay loam, MLRA 108D, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
Y222D2	Clarinda silty clay loam, MLRA 108D, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Y222D3	Clarinda silty clay loam, MLRA 108D, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
Z8B	Judson silty clay loam, MLRA 107B, 2 to 5 percent slopes	Prime farmland

Prime Farmland and Other Important Farmland--Continued

Map symbol	Map unit name	Farmland classification
Z8C	Judson silty clay loam, MLRA 107B, 5 to 9 percent slopes	Farmland of statewide importance
Z24D2	Shelby clay loam, MLRA 107B, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Z24D3	Shelby clay loam, MLRA 107B, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
Z24E2	Shelby clay loam, MLRA 107B, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
Z24E3	Shelby clay loam, MLRA 107B, 14 to 18 percent slopes, severely eroded	Farmland of statewide importance
Z24F2	Shelby clay loam, MLRA 107B, 18 to 25 percent slopes, moderately eroded	Farmland of statewide importance
Z82D3	Adair-Shelby complex, MLRA 107B, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
Z93C2	Shelby-Adair complex, MLRA 107B, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
Z93D2	Shelby-Adair complex, MLRA 107B, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
Z93E2	Shelby-Adair complex, MLRA 107B, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
Z192C3	Adair clay loam, MLRA 107B, 5 to 9 percent slopes, severely eroded	Farmland of statewide importance
Z222D2	Clarinda silty clay loam, MLRA 107B, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. 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.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

The table “Windbreaks and Environmental Plantings” shows the height that locally grown trees and shrubs are expected to reach in 20 years on soils in the survey area. The estimates in the table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
7:				
Wiota, rarely flooded	Silky dogwood	American cranberrybush	Black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
7B:				
Wiota, rarely flooded	Silky dogwood	American cranberrybush	Black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
9:				
Marshall	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
9B:				
Marshall	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
9C2:				
Marshall, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
9C3:				
Marshall, severely eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
9D2:				
Marshall, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
15B:				
Olmitz	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Ely	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Zook	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
16:				
Nodaway, occasionally flooded	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Kennebec, occasionally flooded	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
43:				
Bremer, rarely flooded	Buttonbush; gray dogwood; ninebark; silky dogwood	American cranberrybush; elderberry; nannyberry; redosier dogwood	Arborvitae; blue spruce; eastern arborvitae; Washington hawthorn; white fir	Common hackberry; eastern white pine; Norway spruce; silver maple
54:				
Zook, occasionally flooded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
54+:				
Zook, occasionally flooded, overwash	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
88:				
Nevin, rarely flooded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
99D2:				
Exira, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
99D3:				
Exira, severely eroded--	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
99E2:				
Exira, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
99E3:				
Exira, severely eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
113B:				
Colo, frequently flooded, overwash	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
Ely	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
136:				
Ankeny, occasionally flooded	Buttonbush; gray dogwood; mapleleaf viburnum	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; sandbar willow; serviceberry; southern arrowwood	Black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black oak; chinkapin oak; common hackberry; common pawpaw; hickory; northern red oak; Norway spruce; red pine; white oak

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
212: Kennebec, occasionally flooded	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
220: Nodaway, occasionally flooded	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
229C2: Clarinda, moderately eroded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Clarinda, severely eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
229D2: Clarinda, moderately eroded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Clarinda, severely eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
247D2:				
Shelby, sandy substratum, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Hesch, deep, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple; white oak
Hesch, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple; white oak
269:				
Humeston, occasionally flooded, occasionally ponded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
273B:				
Olmitz	---	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
289D2:				
Dickman, loamy substratum, moderately eroded	Gray dogwood; mapleleaf viburnum	American plum; beaked hazelnut; chokecherry; downy arrowwood; Nanking cherry; ninebark; southern arrowwood; Washington hawthorn	Black Hills spruce; blackhaw; butternut; common hackberry; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; white fir	Black oak; bur oak; northern red oak; red pine; shagbark hickory; white oak
Marshall, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
300:				
Bremer, terrace	Buttonbush; gray dogwood; ninebark; silky dogwood	American cranberrybush; elderberry; nannyberry; redosier dogwood	Arborvitae; blue spruce; eastern arborvitae; Washington hawthorn; white fir	Common hackberry; eastern white pine; Norway spruce; silver maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
337D2:				
Dickman, loamy substratum, moderately eroded	Gray dogwood; mapleleaf viburnum	American plum; beaked hazelnut; chokecherry; downy arrowwood; Nanking cherry; ninebark; southern arrowwood; Washington hawthorn	Black Hills spruce; blackhaw; butternut; common hackberry; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; white fir	Black oak; bur oak; northern red oak; red pine; shagbark hickory; white oak
Sharpsburg, moderately eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
370:				
Sharpsburg	Fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black walnut; common hackberry; hackberry; honeylocust; northern red oak; Norway spruce; red pine; shagbark hickory; silver maple; sugar maple; white oak
370B:				
Sharpsburg	Fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black walnut; common hackberry; honeylocust; northern red oak; Norway spruce; red pine; shagbark hickory; silver maple; sugar maple; white oak

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
371C2:				
Sharpsburg, moderately eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Nira, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
371D2:				
Sharpsburg	Fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black walnut; common hackberry; honeylocust; northern red oak; Norway spruce; red pine; shagbark hickory; silver maple; sugar maple; white oak
Sharpsburg, moderately eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Nira, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
371E2:				
Sharpsburg, moderately eroded	Gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black walnut; common hackberry; northern red oak; Norway spruce; red pine; shagbark hickory; silver maple; sugar maple; white oak
Nira, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
430:				
Ackmore, occasionally flooded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; silky dogwood; winterberry	American plum; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; southern arrowwood	Arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn	Bur oak; common hackberry; common pawpaw; pin oak; river birch; swamp white oak

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
431B:				
Judson	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Ackmore, rarely flooded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; silky dogwood; winterberry	American plum; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; southern arrowwood	Arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn	Bur oak; common hackberry; common pawpaw; pin oak; river birch; swamp white oak
Colo, frequently flooded, overwash	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
435:				
Zook, occasionally flooded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Mt. Sterling, occasionally flooded	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
469C2:				
Lamoni, moderately eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
469C2:				
Clarinda, moderately eroded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
469C3:				
Lamoni, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Clarinda, severely eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
470D2:				
Lamoni, moderately eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
509B:				
Marshall, terrace	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
509C:				
Marshall, terrace	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
509C2:				
Marshall, terrace, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
545B:				
Zook	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Ely	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Gullied land.				

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
733:				
Calco, occasionally flooded	Gray dogwood	American plum; Nanking cherry; nannyberry; ninebark	Common hackberry; eastern redcedar; jack pine	Bur oak; river birch; swamp white oak
803:				
Melia, terrace	Fragrant sumac; gray dogwood; hazelnut; Peking cotoneaster; redosier dogwood	Autumn olive; chokecherry	Black walnut; bur oak; eastern redcedar; eastern white pine; northern red oak; Washington hawthorn	Black locust; jack pine; Norway spruce; ponderosa pine; silver maple
824E3:				
Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Lamoni, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
870B:				
Sharpsburg, terrace	Fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	American basswood; black walnut; common hackberry; honeylocust; northern red oak; Norway spruce; red pine; shagbark hickory; silver maple; sugar maple; white oak
1239:				
Corley, terrace	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
1239:				
Minden, terrace	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; silky dogwood; winterberry	American plum; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; southern arrowwood	Arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn	Bur oak; common hackberry; common pawpaw; pin oak; river birch; swamp white oak
2428:				
Ely	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Colo, overwash	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
Mt. Sterling	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple
4946C. Udorthents-Interstate highway				
5030. Pits, limestone quarry				
5040. Udorthents, loamy				
5080. Udorthents, sanitary landfill				
AW. Animal waste lagoon				
SL. Sewage lagoon				
W. Water				

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y8B: Judson	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Y8C: Judson	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Y24C2: Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y24D2: Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Y24D3: Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Y24E: Shelby	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y24E2: Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Y24E3: Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Y24F2: Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Y24F3: Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y82C3:				
Adair, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Y93D2:				
Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Y93D3:				
Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y93D3:				
Adair, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Y93E2:				
Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Y192C2:				
Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Y192D2:				
Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Y222C2:				
Clarinda, moderately eroded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Y222D2: Clarinda, moderately eroded	Buttonbush; gray dogwood; ninebark; silky dogwood	Elderberry; nannyberry; redosier dogwood	Arborvitae; Washington hawthorn	Common hackberry; silver maple
Y222D3: Clarinda, severely eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Z8B: Judson	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Z8C: Judson	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Z24D2: Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Z24D3: Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Z24E2: Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Z24E3: Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Z24F2: Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Z82D3: Adair, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Shelby, severely eroded	Silky dogwood	American cranberrybush	Blue spruce; eastern arborvitae; Washington hawthorn; white fir	Norway spruce
Z93C2: Shelby, moderately eroded	Buttonbush; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American cranberrybush; American plum; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blue spruce; bur oak; eastern arborvitae; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35
Z93C2: Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Z93D2: Shelby, moderately eroded	Buttonbush; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; beaked hazelnut; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; blackhaw; bur oak; butternut; eastern redbud; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; common pawpaw; eastern redcedar; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple
Adair, moderately eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; silky dogwood; winterberry	American plum; chokecherry; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; southern arrowwood	Arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn	Bur oak; common hackberry; common pawpaw; pin oak; river birch; swamp white oak
Z93E2: Shelby, moderately eroded	Buttonbush; common lilac; fragrant sumac; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; Amur maple; autumn olive; beaked hazelnut; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; nannyberry; ninebark; redosier dogwood; serviceberry; southern arrowwood	Arborvitae; black cherry; Black Hills spruce; bur oak; common hackberry; eastern redbud; eastern redcedar; jack pine; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white oak; white spruce	American basswood; black oak; black walnut; chinkapin oak; common hackberry; eastern redcedar; eastern white pine; honeylocust; northern red oak; Norway spruce; shagbark hickory; silver maple; sugar maple

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--			
	<8	8-15	16-25	26-35
Z93E2: Adair, moderately eroded	American cranberrybush	Eastern redcedar; southern arrowwood; Washington hawthorn	Osageorange	Eastern white pine; pin oak
Z192C3: Adair, severely eroded	American cranberry viburnum; American hazelnut; buttonbush; gray dogwood; mapleleaf viburnum; nannyberry; Peking cotoneaster; silky dogwood	American plum; chokecherry; common lilac; downy arrowwood; elderberry; highbush cranberry; Nanking cherry; ninebark; redosier dogwood; sandbar willow; serviceberry; Siberian peashrub; southern arrowwood	Amur maple; arborvitae; beaked hazelnut; eastern redbud; eastern redcedar; Manchurian crabapple; Midwest crabapple; radiant crabapple; red splendor crabapple; sargent crabapple; Washington hawthorn; white fir; white spruce	Bur oak; common hackberry; honeylocust; Norway spruce; pin oak; river birch; swamp white oak
Z222D2: Clarinda, moderately eroded	Buttonbush; silky dogwood; winterberry	Elderberry; redosier dogwood	---	Common hackberry; silver maple

Agricultural Waste Management

The table “Agricultural Waste Management” is described in this section.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

This table shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by

which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

A soil feature considered in the ratings for application of manure, sewage sludge, and wastewater is depth to the top of a water table (saturated zone). During August, September, and October, this depth is generally more than 60 cm in normal years. For soils that are limited by wetness, “Nov-Jul” indicates the most problematic months of the year for application of manure, sewage sludge, and wastewater. These soils may be slow to drain and can become waterlogged and boggy during periods of heavy precipitation.

Agricultural Waste Management

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Too acid	0.03	Too acid	0.14	Too acid	0.14
				Flooding	0.40		
7B:							
Wiota, rarely flooded	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Too acid	0.03	Too acid	0.14	Too acid	0.14
				Flooding	0.40	Too steep for surface application	0.08
9:							
Marshall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Too acid	0.02	Too acid	0.07	Too acid	0.07
9B:							
Marshall	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Too acid	0.02	Too acid	0.07	Too acid	0.07
						Too steep for surface application	0.08
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07		
						Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
9C3:							
Marshall, severely eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.22
		Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.78
						Too acid	0.07
15B:							
Olmitz	35	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.70			Too steep for surface application	0.08
Zook	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Runoff	0.40			Too steep for surface application	0.08
16:							
Nodaway, occasionally flooded	55	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
16:							
Kennebec, occasionally flooded	35	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.50	Flooding	0.40		
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff	0.40				
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Leaching	0.50				
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Flooding	0.40		

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
99D2:							
Exira, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63		
		Too acid	0.08	Too acid	0.31	Slow water movement	0.22
						Too steep for sprinkler application	0.78
						Too acid	0.31
99D3:							
Exira, severely eroded	75	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63		
		Too acid	0.08	Too acid	0.31	Slow water movement	0.22
						Too steep for sprinkler application	0.78
						Too acid	0.31
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22		
		Too acid	0.08	Too acid	0.31	Too steep for sprinkler application	1.00
						Slow water movement	0.22
						Too acid	0.31
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22		
		Too acid	0.08	Too acid	0.31	Too steep for sprinkler application	1.00
						Slow water movement	0.22
						Too acid	0.31

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
113B:							
Colo, frequently flooded, overwash	50	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50				
Ely	25	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.70				
136:							
Ankeny, occasionally flooded	95	Somewhat limited		Very limited		Somewhat limited	
		Filtering capacity	0.99	Flooding	1.00	Filtering capacity	0.99
		Flooding	0.60	Filtering capacity	0.99	Flooding	0.60
		Leaching	0.45				
212:							
Kennebec, occasionally flooded	70	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
220:							
Nodaway, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
229C2:							
Clarinda, moderately eroded	40	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
229C2:							
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
229D2:							
Clarinda, moderately eroded	55	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
247D2:							
Shelby, sandy substratum, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.67	Slow water movement	0.22
		Too acid	0.18	Slope	0.63	Too acid	0.67
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
247D2:							
Hesch, deep, moderately eroded--	25	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Hesch, moderately eroded----------	20	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.14	Slow water movement	0.22
		Droughty	0.67	Slope	0.63	Too acid	0.14
		Too acid	0.03	Droughty	0.67	Too steep for sprinkler application	0.78
						Droughty	0.67
269:							
Humeston, occasionally flooded, occasionally ponded----------	100	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Ponding	1.00
		Leaching	0.50	Ponding	1.00	Flooding	0.60
273B:							
Olmitz----------	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
						Too steep for surface application	0.08
289D2:							
Dickman, loamy substratum, moderately eroded--	35	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Leaching	0.45			Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
289D2:							
Marshall, moderately eroded--	30	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.22
		Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.78
						Too acid	0.07
300:							
Bremer, terrace-----	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.50				
337D2:							
Dickman, loamy substratum, moderately eroded--	45	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.22
		Leaching	0.45			Too steep for sprinkler application	0.78
Sharpsburg, moderately eroded--	40	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.63	Too acid	0.67	Too steep for surface application	1.00
		Too acid	0.18	Slope	0.63	Too acid	0.67
						Too steep for sprinkler application	0.78
370:							
Sharpsburg----------	95	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too acid	0.05	Too acid	0.21	Too acid	0.21

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
370B:							
Sharpsburg	80	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too acid	0.05	Too acid	0.21	Too acid	0.21
						Too steep for surface application	0.08
371C2:							
Sharpsburg, moderately eroded	65	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too acid	0.18	Too acid	0.67	Too steep for surface application	0.92
						Too acid	0.67
						Too steep for sprinkler application	0.02
Nira, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
371D2:							
Sharpsburg	45	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.63	Too acid	0.21	Too steep for surface application	1.00
		Too acid	0.05	Slope	0.63		
						Too acid	0.21
						Too steep for sprinkler application	0.78
Sharpsburg, moderately eroded	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Slope	0.63	Too acid	0.67	Too steep for surface application	1.00
		Too acid	0.18	Slope	0.63		
						Too acid	0.67
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
371D2:							
Nira, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Too acid	0.18	Too acid	0.67		
						Too steep for sprinkler application	1.00
						Too acid	0.67
Nira, moderately eroded	10	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Flooding	1.00	Slow water movement	0.22
		Flooding	0.60	Slow water movement	0.22	Flooding	0.60
		Leaching	0.50				
431B:							
Judson	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Slow water movement	0.22	Slow water movement	0.22
						Too steep for surface application	0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
431B:							
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50	Flooding	0.40		
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50				
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff	0.40				
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Leaching	0.50				
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
469C2:							
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Shelby, moderately eroded	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
469C3:							
Shelby, severely eroded	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
						Too acid	0.07
		Slope	0.63	Too acid	0.07	Too steep for sprinkler application	0.78
		Too acid	0.02	Slope	0.63		
Shelby, moderately eroded	25	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
509B:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Too acid	0.02	Too acid	0.07	Too acid	0.07
						Too steep for surface application	0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
509C:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
509C2:							
Marshall, terrace, moderately eroded	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
						Slow water movement	0.22
						Too steep for sprinkler application	0.02
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Runoff	0.40			Too steep for surface application	0.08
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.70			Too steep for surface application	0.08
Gullied land	20	Not rated		Not rated		Not rated	
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Flooding	1.00	Slow water movement	0.22
		Flooding	0.60	Slow water movement	0.22	Flooding	0.60
		Leaching	0.50				

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
803:							
Melia, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
				Too acid	0.01	Too acid	0.01
824E3:							
Shelby, severely eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22		
		Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	1.00
						Slow water movement	0.22
						Too acid	0.07
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Too steep	1.00	Too steep	1.00	Too steep for sprinkler application	
		Too acid	0.02	Too acid	0.07		
						Too acid	0.07
870B:							
Sharpsburg, terrace	85	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Too acid	0.11	Too acid	0.42	Too acid	0.42
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50				

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.70				
Colo, overwash	25	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Slow water movement	0.30	Slow water movement	0.22	Slow water movement	0.22
		Leaching	0.50				
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Leaching	0.50				
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Slow water movement	0.22	Slow water movement	0.22
						Too steep for surface application	0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y8C:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Too acid	0.42	Too steep for surface application	0.92
		Too acid	0.11	Slow water movement	0.22	Too acid	0.42
						Slow water movement	0.22
						Too steep for sprinkler application	0.02
Y24C2:							
Shelby, moderately eroded	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
Y24D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Y24D3:							
Shelby, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y24E:							
Shelby	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.05	Too acid	0.21	Slow water movement	0.22
						Too acid	0.21
Y24E2:							
Shelby, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
Y24E3:							
Shelby, severely eroded	65	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
Y24F2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y24F3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Shelby, severely eroded	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
Y93D2:							
Shelby, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y93D2:							
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Y93D3:							
Shelby, severely eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Y93E2:							
Shelby, moderately eroded	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y93E2:							
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Too steep	1.00	Too steep	1.00	Too steep for sprinkler application	
		Too acid	0.02	Too acid	0.07	Too acid	0.07
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Y222C2:							
Clarinda, moderately eroded	75	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Z8B:							
Judson	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Slow water movement	0.22	Slow water movement	0.22
						Too steep for surface application	0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Z8C:							
Judson	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Too acid	0.42	Too steep for surface application	0.92
		Too acid	0.11	Slow water movement	0.22	Too acid	0.42
						Slow water movement	0.22
						Too steep for sprinkler application	0.02
Z24D2:							
Shelby, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Z24D3:							
Shelby, severely eroded	85	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Z24E2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Z24E3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
Z24F2:							
Shelby, moderately eroded	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78
Shelby, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Z93C2:							
Shelby, moderately eroded	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Slow water movement	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.02
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
		Too acid	0.02	Too acid	0.07	Too acid	0.07
		Runoff	0.40			Too steep for sprinkler application	0.02
Z93D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Slow water movement	0.22
		Too acid	0.02	Slope	0.63	Too acid	0.07
						Too steep for sprinkler application	0.78
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Slope	0.63	Too acid	0.07	Too acid	0.07
		Too acid	0.02	Slope	0.63	Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
Z93E2:							
Shelby, moderately eroded	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22		
		Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	1.00
						Slow water movement	0.22
						Too acid	0.07
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
		Too steep	1.00	Too steep	1.00	Too steep for sprinkler application	
		Too acid	0.02	Too acid	0.07		
						Too acid	0.07
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	0.92
						Too acid	0.07
		Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.02
		Runoff	0.40				
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Strongly contrasting textural stratification	1.00	Strongly contrasting textural stratification	1.00	Too steep for surface application	1.00
						Too acid	0.07
		Slope	0.63	Too acid	0.07	Too steep for sprinkler application	0.78
		Too acid	0.02	Slope	0.63		

Recreational Development

The titles of the tables described in this section are:

- “Camp Areas, Picnic Areas, and Playgrounds”
- “Paths, Trails, and Golf Fairways”

In the tables described in this section, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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

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

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 ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and

not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Camp Areas, Picnic Areas, and Playgrounds

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15				
7B:							
Wiota, rarely flooded	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15			Slope	0.50
9:							
Marshall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
9B:							
Marshall	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
9C3:							
Marshall, severely eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
15B:							
Olmitz	35	Not limited		Not limited		Somewhat limited	
						Slope	0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
15B:							
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.50
Zook	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	0.50
16:							
Nodaway, occasionally flooded	55	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Kennebec, occasionally flooded	35	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.99	Slow water movement	0.99
		Slow water movement	0.99				
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Flooding	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00			Flooding	0.60
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.99	Slow water movement	0.99
		Slow water movement	0.99			Flooding	0.60
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15				

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
99D2:							
Exira, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
99D3:							
Exira, severely eroded	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
113B:							
Colo, frequently flooded, overwash	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Flooding	1.00
		Slow water movement	0.15	Flooding	0.40	Slow water movement	0.15
						Slope	0.12
Ely	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.12
136:							
Ankeny, occasionally flooded	95	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
212:							
Kennebec, occasionally flooded	70	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
220:							
Nodaway, occasionally flooded	75	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
229C2:							
Clarinda, moderately eroded--	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Clarinda, severely eroded----------	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
						Too clayey	1.00
229D2:							
Clarinda, moderately eroded--	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Clarinda, severely eroded----------	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Too clayey	1.00
247D2:							
Shelby, sandy substratum, moderately eroded--	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Hesch, deep, moderately eroded--	25	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Hesch, moderately eroded----------	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Gravel	0.08

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Slow water movement	0.99	Slow water movement	0.99
		Slow water movement	0.99			Flooding	0.60
273B:							
Olmitz	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50
289D2:							
Dickman, loamy substratum, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Marshall, moderately eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
300:							
Bremer, terrace	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.99	Slow water movement	0.99	Slow water movement	0.99
337D2:							
Dickman, loamy substratum, moderately eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Sharpsburg, moderately eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.99	Slow water movement	0.99	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.99
370:							
Sharpsburg	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.99	Slow water movement	0.99	Slow water movement	0.99
370B:							
Sharpsburg	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.99	Slow water movement	0.99	Slow water movement	0.99
						Slope	0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
371C2:							
Sharpsburg, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.99	Slow water movement	0.99	Slope	1.00
						Slow water movement	0.99
Nira, moderately eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Slope	1.00
						Depth to saturated zone	0.39
371D2:							
Sharpsburg	45	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.99	Slow water movement	0.99	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.99
Sharpsburg, moderately eroded	20	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.99	Slow water movement	0.99	Slope	1.00
		Slope	0.63	Slope	0.63	Slow water movement	0.99
Nira, moderately eroded	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.99	Slow water movement	0.99	Slow water movement	0.99
Nira, moderately eroded	10	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15			Flooding	0.60
431B:							
Judson	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
431B:							
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15				
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Flooding	1.00
		Slow water movement	0.15	Flooding	0.40	Slow water movement	0.15
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Flooding	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00			Flooding	0.60
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.99	Slow water movement	0.99
		Slow water movement	0.99			Flooding	0.60
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Shelby, moderately eroded	20	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
						Too clayey	1.00
Shelby, severely eroded	20	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Shelby, moderately eroded	25	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
509B:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50
509C:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
509C2:							
Marshall, terrace, moderately eroded	95	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	0.50
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.50
Gullied land	20	Not rated		Not rated		Not rated	
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Slow water movement	0.15
		Slow water movement	0.15			Flooding	0.60
803:							
Melia, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
824E3:							
Shelby, severely eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Slope	1.00
870B:							
Sharpsburg, terrace	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.99	Slow water movement	0.99	Slow water movement	0.99
						Slope	0.12
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
1239:							
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Colo, overwash	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.15	Flooding	1.00
		Slow water movement	0.15	Flooding	0.40	Slow water movement	0.15
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.99	Flooding	1.00
		Slow water movement	0.99	Flooding	0.40	Slow water movement	0.99
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Y8C:							
Judson	85	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
Y24C2:							
Shelby, moderately eroded	60	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
Y24D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24D3:							
Shelby, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24E:							
Shelby	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24E2:							
Shelby, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24E3:							
Shelby, severely eroded	65	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24F2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Y24F3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Shelby, severely eroded	25	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15
Y93D2:							
Shelby, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Y93D3:							
Shelby, severely eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Y93E2:							
Shelby, moderately eroded	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Y222C2:							
Clarinda, moderately eroded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Too clayey	1.00
Z8B:							
Judson	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
						Slope	0.50
Z8C:							
Judson	75	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Z24D2:							
Shelby, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z24D3:							
Shelby, severely eroded	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z24E2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z24E3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z24F2:							
Shelby, moderately eroded	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Shelby, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Z93C2:							
Shelby, moderately eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Slow water movement	0.15	Slow water movement	0.15	Slope	1.00
						Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
Z93C2:							
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Z93D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Z93E2:							
Shelby, moderately eroded	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Slope	1.00
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
						Slope	1.00
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slow water movement	1.00
		Slow water movement	1.00	Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	1.00

Paths, Trails, and Golf Fairways

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Not limited		Not limited		Not limited	
7B:							
Wiota, rarely flooded	85	Not limited		Not limited		Not limited	
9:							
Marshall	90	Not limited		Not limited		Not limited	
9B:							
Marshall	100	Not limited		Not limited		Not limited	
9C2:							
Marshall, moderately eroded	80	Not limited		Not limited		Not limited	
9C3:							
Marshall, severely eroded	80	Not limited		Not limited		Not limited	
9D2:							
Marshall, moderately eroded	70	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
15B:							
Olmitz	35	Not limited		Not limited		Not limited	
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Zook	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
16:							
Nodaway, occasionally flooded	55	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
Kennebec, occasionally flooded	35	Not limited		Not limited		Very limited	
						Too dense	1.00
						Flooding	0.60

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
99D2:							
Exira, moderately eroded	65	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
99D3:							
Exira, severely eroded	75	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02				
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02				
113B:							
Colo, frequently flooded, overwash	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
Ely	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
136:							
Ankeny, occasionally flooded	95	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
212:							
Kennebec, occasionally flooded	70	Not limited		Not limited		Very limited	
						Too dense	1.00
						Flooding	0.60
220:							
Nodaway, occasionally flooded	75	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
229C2:							
Clarinda, moderately eroded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
229D2:							
Clarinda, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
						Slope	0.63
247D2:							
Shelby, sandy substratum, moderately eroded	35	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Hesch, deep, moderately eroded	25	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Hesch, moderately eroded	20	Not limited		Not limited		Somewhat limited	
						Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
						Flooding	0.60
273B:							
Olmitz	80	Not limited		Not limited		Not limited	
289D2:							
Dickman, loamy substratum, moderately eroded	35	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Marshall, moderately eroded	30	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
300:							
Bremer, terrace	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
337D2:							
Dickman, loamy substratum, moderately eroded	45	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Sharpsburg, moderately eroded	40	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
370:							
Sharpsburg	95	Not limited		Not limited		Not limited	
370B:							
Sharpsburg	80	Not limited		Not limited		Not limited	
371C2:							
Sharpsburg, moderately eroded	65	Not limited		Not limited		Not limited	
Nira, moderately eroded	30	Not limited		Not limited		Somewhat limited	
						Depth to saturated zone	0.19
371D2:							
Sharpsburg	45	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
371D2:							
Sharpsburg, moderately eroded	20	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Nira, moderately eroded	20	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
						Depth to saturated zone	0.19
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02				
Nira, moderately eroded	10	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02			Depth to saturated zone	0.19
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
431B:							
Judson	50	Not limited		Not limited		Not limited	
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Shelby, moderately eroded	20	Not limited		Not limited		Not limited	
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
Shelby, severely eroded	20	Not limited		Not limited		Not limited	
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Shelby, moderately eroded	25	Not limited		Not limited		Somewhat limited	
						Slope	0.63
509B:							
Marshall, terrace	90	Not limited		Not limited		Not limited	
509C:							
Marshall, terrace	90	Not limited		Not limited		Not limited	
509C2:							
Marshall, terrace, moderately eroded	95	Not limited		Not limited		Not limited	
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Gullied land	20	Not rated		Not rated		Not rated	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
803:							
Melia, terrace	90	Not limited		Not limited		Not limited	
824E3:							
Shelby, severely eroded	50	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.02			Too steep	1.00
870B:							
Sharpsburg, terrace	85	Not limited		Not limited		Not limited	
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Colo, overwash	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40	Flooding	1.00
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Not limited		Not limited		Not limited	
Y8C:							
Judson	85	Not limited		Not limited		Not limited	
Y24C2:							
Shelby, moderately eroded	60	Not limited		Not limited		Not limited	
Y24D2:							
Shelby, moderately eroded	65	Not limited		Not limited		Somewhat limited	
		Slope	0.63			Slope	0.63
Y24D3:							
Shelby, severely eroded	55	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Y24E:							
Shelby	60	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Y24E2:							
Shelby, moderately eroded	55	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Y24E3:							
Shelby, severely eroded	65	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Y24F2:							
Shelby, moderately eroded	50	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Too steep	1.00
Y24F3:							
Shelby, severely eroded	55	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Too steep	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Shelby, severely eroded	25	Not limited		Not limited		Not limited	
Y93D2:							
Shelby, moderately eroded	35	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Y93D3:							
Shelby, severely eroded	35	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Y93E2:							
Shelby, moderately eroded	40	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02				
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Y222C2:							
Clarinda, moderately eroded--	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Y222D2:							
Clarinda, moderately eroded--	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Y222D3:							
Clarinda, severely eroded----------	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
						Slope	0.63
Z8B:							
Judson----------	80	Not limited		Not limited		Not limited	
Z8C:							
Judson----------	75	Not limited		Not limited		Not limited	
Z24D2:							
Shelby, moderately eroded----------	55	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Z24D3:							
Shelby, severely eroded----------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Z24E2:							
Shelby, moderately eroded----------	50	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Z24E3:							
Shelby, severely eroded----------	55	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Z24F2:							
Shelby, moderately eroded----------	60	Somewhat limited		Not limited		Very limited	
		Slope	0.82			Too steep	1.00
Z82D3:							
Adair, severely eroded----------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
Z82D3:							
Shelby, severely eroded	30	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Z93C2:							
Shelby, moderately eroded	40	Not limited		Not limited		Not limited	
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Z93D2:							
Shelby, moderately eroded	65	Not limited		Not limited		Somewhat limited	
						Slope	0.63
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
Z93E2:							
Shelby, moderately eroded	45	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Too steep	1.00
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Too steep	1.00
		Slope	0.02				
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Water erosion	1.00	Water erosion	1.00	Slope	0.63

Wildlife Habitat

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

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

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

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

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

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

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

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness.

Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn olive and crabapple.

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

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

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

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

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

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

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

Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
7:										
Wiota, rarely flooded	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
7B:										
Wiota, rarely flooded	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
9:										
Marshall	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
9B:										
Marshall	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
9C2:										
Marshall, moderately eroded	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
9C3:										
Marshall, severely eroded	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
9D2:										
Marshall, moderately eroded	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
15B:										
Olmitz	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor
Ely	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor
Zook	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
16:										
Nodaway, occasionally flooded	Good	Good	Good	Good	Fair	Fair	Poor	Fair	Good	Fair
Kennebec, occasionally flooded	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
43:										
Bremer, rarely flooded	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
54:										
Zook, occasionally flooded	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
54+:										
Zook, occasionally flooded, overwash	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
88:										
Nevin, rarely flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for-: Openland wildlife	Woodland wildlife	Wetland wildlife
99D2:										
Exira, moderately eroded	Good	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor
99D3:										
Exira, severely eroded--	Good	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor
99E2:										
Exira, moderately eroded	Good	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor
99E3:										
Exira, severely eroded--	Good	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor
113B:										
Colo, frequently flooded, overwash------	Good	Fair	Good	Fair	Poor	Fair	Fair	Fair	Fair	Good
Ely----------	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor
136:										
Ankeny, occasionally flooded----------	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
212:										
Kennebec, occasionally flooded----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
220:										
Nodaway, occasionally flooded----------	Good	Good	Good	Good	Fair	Fair	Poor	Fair	Good	Fair
229C2:										
Clarinda, moderately eroded----------	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Clarinda, severely eroded----------	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
229D2:										
Clarinda, moderately eroded----------	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Clarinda, severely eroded----------	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
247D2:										
Shelby, sandy substratum, moderately eroded----------	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Hesch, deep, moderately eroded----------	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Hesch, moderately eroded	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
269:										
Humeston, occasionally flooded, occasionally ponded	Good	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
273B:										
Olmitz	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor
289D2:										
Dickman, loamy substratum, moderately eroded	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Marshall, moderately eroded	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
300:										
Bremer, terrace	Good	Good	Good	Fair	Poor	Good	Good	Good	Fair	Good
337D2:										
Dickman, loamy substratum, moderately eroded	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Sharpsburg, moderately eroded	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
370:										
Sharpsburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
370B:										
Sharpsburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
371C2:										
Sharpsburg, moderately eroded	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Nira, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Poor	Fair	Good	Very poor
371D2:										
Sharpsburg	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Sharpsburg, moderately eroded	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Nira, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Poor	Fair	Good	Very poor
371E2:										
Sharpsburg, moderately eroded	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Nira, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Poor	Fair	Good	Very poor
430:										
Ackmore, occasionally flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for-: Openland wildlife	Woodland wildlife	Wetland wildlife
431B:										
Judson	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Ackmore, rarely flooded	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
Colo, frequently flooded, overwash	Good	Fair	Good	Fair	Poor	Fair	Fair	Fair	Fair	Good
435:										
Zook, occasionally flooded	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
Mt. Sterling, occasionally flooded	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
469C2:										
Lamoni, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Clarinda, moderately eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
469C3:										
Lamoni, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Clarinda, severely eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
470D2:										
Lamoni, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
509B:										
Marshall, terrace	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
509C:										
Marshall, terrace	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
509C2:										
Marshall, terrace, moderately eroded	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
545B:										
Zook	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good
Ely	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
545B:										
Gullied land.										
733:										
Calco, occasionally flooded	Good	Fair	Good	Poor	Very poor	Good	Good	Fair	Poor	Fair
803:										
Melia, terrace	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
824E3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Lamoni, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
870B:										
Sharpsburg, terrace	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
1239:										
Corley, terrace	Good	Good	Good	Good	Fair	Good	Good	Good	Good	Good
Minden, terrace	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
2428:										
Ely	Good	Good	Good	Good	Good	Fair	Very poor	Good	Good	Poor
Colo, overwash	Good	Fair	Good	Fair	Poor	Fair	Fair	Fair	Fair	Good
Mt. Sterling	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
4946C.										
Udorthents-Interstate highway										
5030.										
Pits, limestone quarry										
5040.										
Udorthents, loamy										
5080.										
Udorthents, sanitary landfill										
AW.										
Animal waste lagoon										
SL.										
Sewage lagoon										
W.										
Water										
Y8B:										
Judson	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Y8C:										
Judson	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Y24C2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Y24D2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Y24D3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Y24E:										
Shelby	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Y24E2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Y24E3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Y24F2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Y24F3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Y82C3:										
Adair, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Y93D2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Y93D3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Adair, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Y93E2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Y192C2:										
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Y192D2:										
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Y222C2:										
Clarinda, moderately eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Y222D2:										
Clarinda, moderately eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Y222D3:										
Clarinda, severely eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor
Z8B:										
Judson	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Z8C:										
Judson	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Z24D2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Z24D3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Z24E2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Z24E3:										
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Z24F2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Z82D3:										
Adair, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Shelby, severely eroded	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
Z93C2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
Z93D2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Z93E2:										
Shelby, moderately eroded	Fair	Good	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Adair, moderately eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Z192C3:										
Adair, severely eroded	Fair	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor
Z222D2:										
Clarinda, moderately eroded	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor

Engineering

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

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 between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary, which is in Part I of this publication.

Building Site Development

The titles of the tables described in this section are:

- “Dwellings and Small Commercial Buildings”
- “Roads and Streets, Shallow Excavations, and Lawns and Landscaping”

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The tables described in this section show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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 soil material stabilized by lime or cement; and a surface of

flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Dwellings and Small Commercial Buildings

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.61		
7B:							
Wiota, rarely flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.61		
9:							
Marshall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9B:							
Marshall	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
9C3:							
Marshall, severely eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
15B:							
Olmitz	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.61		
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
15B:							
Zook	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
16:							
Nodaway, occasionally flooded	55	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		
Kennebec, occasionally flooded	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
99D2:							
Exira, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
99D3:							
Exira, severely eroded	75	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
113B:							
Colo, frequently flooded, overwash	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ely	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
136:							
Ankeny, occasionally flooded	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
212:							
Kennebec, occasionally flooded	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		
220:							
Nodaway, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
229C2:							
Clarinda, moderately eroded--	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
Clarinda, severely eroded----------	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
229D2:							
Clarinda, moderately eroded--	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
Clarinda, severely eroded----------	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
247D2:							
Shelby, sandy substratum, moderately eroded--	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Hesch, deep, moderately eroded--	25	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Hesch, moderately eroded----------	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.64		
269:							
Humeston, occasionally flooded, occasionally ponded----------	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Shrink-swell	1.00	Ponding	1.00
		Shrink-swell	0.50	Ponding	1.00	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
273B:							
Olmitz	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.61		
289D2:							
Dickman, loamy substratum, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Marshall, moderately eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
300:							
Bremer, terrace	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
337D2:							
Dickman, loamy substratum, moderately eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Sharpsburg, moderately eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
				Depth to saturated zone	0.61		
370:							
Sharpsburg	95	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.61		
370B:							
Sharpsburg	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.61		
371C2:							
Sharpsburg, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
				Depth to saturated zone	0.61	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
371C2:							
Nira, moderately eroded	30	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	0.88
		Depth to saturated zone	0.39	Shrink-swell	0.50	Shrink-swell	0.50
						Depth to saturated zone	0.39
371D2:							
Sharpsburg	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
				Depth to saturated zone	0.61		
Sharpsburg, moderately eroded	20	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
				Depth to saturated zone	0.61		
Nira, moderately eroded	20	Somewhat limited		Very limited		Very limited	
		Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	1.00
		Slope	0.63	Shrink-swell	0.50	Shrink-swell	0.50
		Depth to saturated zone	0.39	Slope	0.63	Depth to saturated zone	0.39
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.61		
Nira, moderately eroded	10	Very limited		Very limited		Very limited	
		Too steep	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.50	Too steep	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.39	Shrink-swell	0.50	Depth to saturated zone	0.39
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
431B:							
Judson	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
431B:							
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
Shelby, moderately eroded	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
469C3:							
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
Shelby, severely eroded	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Shelby, moderately eroded	25	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
509B:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
509C:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
509C2:							
Marshall, terrace, moderately eroded	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Gullied land	20	Not rated		Not rated		Not rated	

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
803:							
Melia, terrace	90	Not limited		Not limited		Not limited	
824E3:							
Shelby, severely eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
870B:							
Sharpsburg, terrace	85	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
				Depth to saturated zone	0.61		
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Colo, overwash	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Y8C:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Y24C2:							
Shelby, moderately eroded	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Y24D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Y24D3:							
Shelby, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Y24E:							
Shelby	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Y24E2:							
Shelby, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Y24E3:							
Shelby, severely eroded	65	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Y24F2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Y24F3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
						Slope	0.88
Shelby, severely eroded	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Y93D2:							
Shelby, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.73
Y93D3:							
Shelby, severely eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Y93D3:							
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
Y93E2:							
Shelby, moderately eroded	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Shrink-swell	0.73
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.92	Shrink-swell	0.92	Shrink-swell	0.92
						Slope	0.88
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.73
Y222C2:							
Clarinda, moderately eroded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.88
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Z8B:							
Judson	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Z8C:							
Judson	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Z24D2:							
Shelby, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Z24D3:							
Shelby, severely eroded	85	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Z24E2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Z24E3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Z24F2:							
Shelby, moderately eroded	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
						Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50		
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
Shelby, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Z93C2:							
Shelby, moderately eroded	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Z93C2:							
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Slope	0.88
						Shrink-swell	0.73
Z93D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.50
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	0.73
Z93E2:							
Shelby, moderately eroded	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.73	Shrink-swell	0.73	Shrink-swell	0.73
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
						Slope	0.88
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Shrink-swell	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Depth to saturated zone	0.61		
		Low strength	1.00				
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Flooding	0.40				
7B:							
Wiota, rarely flooded	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Depth to saturated zone	0.61		
		Low strength	1.00				
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Flooding	0.40				
9:							
Marshall	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
9B:							
Marshall	100	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
9C2:							
Marshall, moderately eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
9C3:							
Marshall, severely eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
9D2:							
Marshall, moderately eroded	70	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Slope	0.63				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
15B:							
Olmitz	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.61		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Zook	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.01		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
16:							
Nodaway, occasionally flooded	55	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Unstable excavation walls	0.10		
Kennebec, occasionally flooded	35	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Depth to saturated zone	0.61	Too dense	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Unstable excavation walls	0.10		
		Frost action	1.00				
		Low strength	1.00				
		Flooding	0.40				
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
		Frost action	1.00	Too clayey	0.01		
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
		Frost action	1.00	Unstable excavation walls	0.10		
		Flooding	1.00				
		Low strength	1.00				
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
		Flooding	0.40				
99D2:							
Exira, moderately eroded	65	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Slope	0.63				
99D3:							
Exira, severely eroded	75	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Slope	0.63				
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Frost action	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Too steep	1.00				
		Shrink-swell	0.50				
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Frost action	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Too steep	1.00				
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
113B:							
Colo, frequently flooded, overwash--	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Ely----------	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
136:							
Ankeny, occasionally flooded----------	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
212:							
Kennebec, occasionally flooded----------	70	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Depth to saturated zone	0.61	Too dense	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
220:							
Nodaway, occasionally flooded----------	75	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Unstable excavation walls	0.10		
229C2:							
Clarinda, moderately eroded--	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
229C2:							
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Too clayey	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
229D2:							
Clarinda, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Slope	0.63
		Frost action	1.00	Slope	0.63		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Too clayey	1.00
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				
247D2:							
Shelby, sandy substratum, moderately eroded	35	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Hesch, deep, moderately eroded	25	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Unstable excavation walls	1.00	Slope	0.63
		Frost action	0.50	Slope	0.63		
Hesch, moderately eroded	20	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Unstable excavation walls	1.00	Slope	0.63
		Frost action	0.50	Slope	0.63		
				Depth to soft bedrock	0.64		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Unstable excavation walls	0.10		
		Ponding	1.00				
273B:							
Olmitz	80	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.61		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
289D2:							
Dickman, loamy substratum, moderately eroded	35	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Unstable excavation walls	1.00	Slope	0.63
				Slope	0.63		
Marshall, moderately eroded	30	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Slope	0.63				
300:							
Bremer, terrace	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Unstable excavation walls	0.10		
		Frost action	1.00				
		Low strength	1.00				
337D2:							
Dickman, loamy substratum, moderately eroded	45	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Unstable excavation walls	1.00	Slope	0.63
				Slope	0.63		
Sharpsburg, moderately eroded	40	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Depth to saturated zone	0.61		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
370:							
Sharpsburg----------	95	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.61		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
370B:							
Sharpsburg----------	80	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.61		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
371C2:							
Sharpsburg, moderately eroded--	65	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Depth to saturated zone	0.61		
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
Nira, moderately eroded----------	30	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Depth to saturated zone	0.19				
371D2:							
Sharpsburg----------	45	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Slope	0.63	Slope	0.63
		Frost action	1.00	Depth to saturated zone	0.61		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				
Sharpsburg, moderately eroded--	20	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Depth to saturated zone	0.61		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
Nira, moderately eroded----------	20	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Slope	0.63
		Low strength	1.00	Slope	0.63	Depth to saturated zone	0.19
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Depth to saturated zone	0.19				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Very limited		Very limited	
		Frost action	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Depth to saturated zone	0.61		
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
Nira, moderately eroded	10	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Too steep	1.00
		Low strength	1.00	Too steep	1.00	Depth to saturated zone	0.19
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Depth to saturated zone	0.19				
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
431B:							
Judson	50	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
		Flooding	0.40				
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Flooding	0.60	Flooding	0.60
		Frost action	1.00	Too clayey	0.01		
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Too clayey	0.01		
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Shelby, moderately eroded	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Too clayey	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
469C3:							
Shelby, severely eroded	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Too clayey	0.28		
		Slope	0.63	Unstable excavation walls	0.10		
		Frost action	0.50				
Shelby, moderately eroded	25	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
509B:							
Marshall, terrace	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
509C:							
Marshall, terrace	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
509C2:							
Marshall, terrace, moderately eroded	95	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.01		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Gullied land	20	Not rated		Not rated		Not rated	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
803:							
Melia, terrace	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
824E3:							
Shelby, severely eroded	50	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
870B:							
Sharpsburg, terrace	85	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Depth to saturated zone	0.61		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Colo, overwash	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.80	Flooding	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
		Low strength	1.00	Too clayey	0.01		
		Shrink-swell	0.50				
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Y8C:							
Judson	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Y24C2: Shelby, moderately eroded	60	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y24D2: Shelby, moderately eroded	65	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Y24D3: Shelby, severely eroded	55	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Y24E: Shelby	60	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y24E2: Shelby, moderately eroded	55	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y24E3: Shelby, severely eroded	65	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y24F2: Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Y24F3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.40		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Shelby, severely eroded	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Y93D2:							
Shelby, moderately eroded	35	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.73				
		Slope	0.63				
Y93D3:							
Shelby, severely eroded	35	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.40	Slope	0.63
		Frost action	1.00	Slope	0.63		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Y93E2:							
Shelby, moderately eroded	40	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Too steep	1.00				
		Shrink-swell	0.73				
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.92				
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.73				
		Slope	0.63				
Y222C2:							
Clarinda, moderately eroded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Slope	0.63
		Frost action	1.00	Slope	0.63		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Too clayey	1.00
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				
Z8B:							
Judson	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Z8C:							
Judson	75	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Z24D2:							
Shelby, moderately eroded	55	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Z24D3:							
Shelby, severely eroded	85	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Z24E2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Z24E3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Z24F2:							
Shelby, moderately eroded	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.40	Slope	0.63
		Frost action	1.00	Slope	0.63		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				
Shelby, severely eroded	30	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Z93C2:							
Shelby, moderately eroded	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Shrink-swell	0.73				
Z93D2:							
Shelby, moderately eroded	65	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Slope	0.63				
		Frost action	0.50				
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.73				
		Slope	0.63				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Z93E2:							
Shelby, moderately eroded	45	Very limited		Very limited		Very limited	
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Unstable excavation walls	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too steep	1.00	Too steep	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Too steep	1.00				
		Shrink-swell	0.73				
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.40		
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50	Slope	0.63
		Frost action	1.00	Slope	0.63		
		Low strength	1.00	Unstable excavation walls	0.10		
		Slope	0.63				

Sanitary Facilities

The titles of the tables described in this section are:

- “Sewage Disposal”
- “Landfills”

These tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

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. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid 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. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Sewage Disposal

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
7:					
Wiota, rarely flooded	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
7B:					
Wiota, rarely flooded	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00	Slope	0.32
		Flooding	0.40	Flooding	0.40
9:					
Marshall	90	Very limited		Not limited	
		Slow water movement	1.00		
9B:					
Marshall	100	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
9C2:					
Marshall, moderately eroded	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
9C3:					
Marshall, severely eroded	80	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
9D2:					
Marshall, moderately eroded	70	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
15B:					
Olmitz	35	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	0.95	Slope	0.32
				Seepage	0.05
Ely	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.32
				Seepage	0.05
Zook	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.32
16:					
Nodaway, occasionally flooded	55	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	0.95	Seepage	0.05
Kennebec, occasionally flooded	35	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage	0.50
43:					
Bremer, rarely flooded	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
54:					
Zook, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
54+:					
Zook, occasionally flooded, overwash	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.05
88:					
Nevin, rarely flooded	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
99D2:					
Exira, moderately eroded	65	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63	Seepage	0.50
99D3:					
Exira, severely eroded	75	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63	Seepage	0.50
99E2:					
Exira, moderately eroded	75	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.50
99E3:					
Exira, severely eroded	80	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00	Seepage	0.50
113B:					
Colo, frequently flooded, overwash	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
				Slope	0.08
Ely	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.08
				Seepage	0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
136:					
Ankeny, occasionally flooded	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
212:					
Kennebec, occasionally flooded	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage	0.50
220:					
Nodaway, occasionally flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	0.95	Seepage	0.05
229C2:					
Clarinda, moderately eroded	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Clarinda, severely eroded	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
229D2:					
Clarinda, moderately eroded	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Clarinda, severely eroded	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
247D2:					
Shelby, sandy substratum, moderately eroded	35	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.63		
Hesch, deep, moderately eroded	25	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Slope	0.63	Depth to soft bedrock	0.54
Hesch, moderately eroded	20	Very limited		Very limited	
		Filtering capacity	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Slope	0.63		
269:					
Humeston, occasionally flooded, occasionally ponded	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Ponding	1.00
				Seepage	0.50
		Ponding	1.00		
273B:					
Olmitz	80	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00	Slope	0.32
289D2:					
Dickman, loamy substratum, moderately eroded	35	Somewhat limited		Very limited	
		Slow water movement	0.92	Slope	1.00
				Seepage	1.00
		Slope	0.63		
Marshall, moderately eroded	30	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
300:					
Bremer, terrace	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
337D2:					
Dickman, loamy substratum, moderately eroded	45	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
Sharpsburg, moderately eroded	40	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.71
		Slope	0.63		
370:					
Sharpsburg	95	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00		
370B:					
Sharpsburg	80	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00	Slope	0.32
371C2:					
Sharpsburg, moderately eroded	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.71
Nira, moderately eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.95	Slope	1.00
				Seepage	0.05
371D2:					
Sharpsburg	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.71
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
371D2:					
Sharpsburg, moderately eroded	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	0.71
		Slope	0.63		
Nira, moderately eroded	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	0.95	Depth to saturated zone	1.00
		Slope	0.63	Seepage	0.05
371E2:					
Sharpsburg, moderately eroded	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00		
Nira, moderately eroded	10	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Depth to saturated zone	1.00
		Slow water movement	0.95	Seepage	0.05
430:					
Ackmore, occasionally flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
431B:					
Judson	50	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
Ackmore, rarely flooded	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
431B:					
Colo, frequently flooded, overwash	15	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
435:					
Zook, occasionally flooded	40	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
Mt. Sterling, occasionally flooded	35	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
469C2:					
Lamoni, moderately eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Clarinda, moderately eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Shelby, moderately eroded	20	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
469C3:					
Lamoni, severely eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
469C3:					
Clarinda, severely eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Shelby, severely eroded	20	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
470D2:					
Lamoni, moderately eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Shelby, moderately eroded	25	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
509B:					
Marshall, terrace	90	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
509C:					
Marshall, terrace	90	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
509C2:					
Marshall, terrace, moderately eroded	95	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
545B:					
Zook	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.32
Ely	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	0.32
				Seepage	0.05
Gullied land	20	Not rated		Not rated	

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
733:					
Calco, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
803:					
Melia, terrace	90	Very limited		Not limited	
		Slow water movement	1.00		
824E3:					
Shelby, severely eroded	50	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Lamoni, severely eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Too steep	1.00		
		Slow water movement	1.00		
870B:					
Sharpsburg, terrace	85	Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Slow water movement	1.00	Slope	0.08
1239:					
Corley, terrace	60	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
Minden, terrace	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
2428:					
Ely	45	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
2428:					
Colo, overwash	25	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
Mt. Sterling	20	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50
4946C:					
Udorthents	65	Not rated		Not rated	
Interstate highway	30	Not rated		Not rated	
5030:					
Pits, limestone quarry	100	Not rated		Not rated	
5040:					
Udorthents, loamy	100	Not rated		Not rated	
5080:					
Udorthents, sanitary landfill	100	Not rated		Not rated	
AW:					
Animal waste lagoon	100	Not rated		Not rated	
SL:					
Sewage lagoon	100	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	
Y8B:					
Judson	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
Y8C:					
Judson	85	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
Y24C2:					
Shelby, moderately eroded	60	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Y24D2:					
Shelby, moderately eroded	65	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Y24D3:					
Shelby, severely eroded	55	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Y24E:					
Shelby	60	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Y24E2:					
Shelby, moderately eroded	55	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Y24E3:					
Shelby, severely eroded	65	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Y24F2:					
Shelby, moderately eroded	50	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Y24F3:					
Shelby, severely eroded	55	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Y82C3:					
Adair, severely eroded	60	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Shelby, severely eroded	25	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Y93D2:					
Shelby, moderately eroded	35	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Adair, moderately eroded	25	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Slow water movement	1.00		
		Slope	0.63		
Y93D3:					
Shelby, severely eroded	35	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Adair, severely eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Slow water movement	1.00		
		Slope	0.63		
Y93E2:					
Shelby, moderately eroded	40	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Adair, moderately eroded	30	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
				Depth to saturated zone	1.00
		Too steep	1.00		
		Slow water movement	1.00		
Y192C2:					
Adair, moderately eroded	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Y192D2:					
Adair, moderately eroded	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Y222C2:					
Clarinda, moderately eroded	75	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Y222D2:					
Clarinda, moderately eroded	60	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Y222D3:					
Clarinda, severely eroded	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Z8B:					
Judson	80	Very limited		Somewhat limited	
		Slow water movement	1.00	Slope	0.32
Z8C:					
Judson	75	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
Z24D2:					
Shelby, moderately eroded	55	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Z24D3:					
Shelby, severely eroded	85	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Z24E2:					
Shelby, moderately eroded	50	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Z24E3:					
Shelby, severely eroded	55	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Z24F2:					
Shelby, moderately eroded	60	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Z82D3:					
Adair, severely eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Shelby, severely eroded	30	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
Z93C2:					
Shelby, moderately eroded	40	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
Adair, moderately eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Z93D2:					
Shelby, moderately eroded	65	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
Z93D2:					
Adair, moderately eroded	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		
Z93E2:					
Shelby, moderately eroded	45	Very limited		Very limited	
		Too steep	1.00	Slope	1.00
		Slow water movement	1.00		
Adair, moderately eroded	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Too steep	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
Z192C3:					
Adair, severely eroded	55	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Slope	1.00
Z222D2:					
Clarinda, moderately eroded	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Slope	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Slope	0.63		

Landfills

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50	Flooding	0.40		
		Flooding	0.40				
7B:							
Wiota, rarely flooded	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50	Flooding	0.40		
		Flooding	0.40				
9:							
Marshall	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9B:							
Marshall	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9C3:							
Marshall, severely eroded	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
15B:							
Olmitz	35	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
15B:							
Zook	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
16:							
Nodaway, occasionally flooded	55	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
Kennebec, occasionally flooded	35	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
43:							
Bremer, rarely flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Flooding	0.40	Hard to compact	1.00
		Flooding	0.40			Too clayey	0.50
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
54+:							
Zook, occasionally flooded, overwash	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
88:							
Nevin, rarely flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
99D2:							
Exira, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
						Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
99D3:							
Exira, severely eroded	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
						Too clayey	0.50
99E2:							
Exira, moderately eroded	75	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
						Too clayey	0.50
99E3:							
Exira, severely eroded	80	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
						Too clayey	0.50
113B:							
Colo, frequently flooded, overwash	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Ely	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
136:							
Ankeny, occasionally flooded	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.31
		Seepage, bottom layer	1.00	Seepage	1.00		
212:							
Kennebec, occasionally flooded	70	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
220:							
Nodaway, occasionally flooded	75	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
229C2:							
Clarinda, moderately eroded	40	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00
						Hard to compact	1.00
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00
						Hard to compact	1.00
229D2:							
Clarinda, moderately eroded	55	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.63	Hard to compact	1.00
		Slope	0.63			Slope	0.63
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63
247D2:							
Shelby, sandy substratum, moderately eroded	35	Very limited		Somewhat limited		Somewhat limited	
		Seepage, bottom layer	1.00	Slope	0.63	Seepage	0.50
		Slope	0.63			Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Hesch, deep, moderately eroded	25	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Slope	0.63	Slope	0.63	Slope	0.63
Hesch, moderately eroded	20	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too sandy	0.50			Too sandy	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Too clayey	0.50
		Too clayey	0.50				
273B:							
Olmitz	80	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
289D2:							
Dickman, loamy substratum, moderately eroded	35	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Seepage	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.63	Slope	0.63
						Too sandy	0.50
Marshall, moderately eroded	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
300:							
Bremer, terrace	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
337D2:							
Dickman, loamy substratum, moderately eroded	45	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Seepage	1.00	Seepage	1.00
		Too sandy	0.50	Slope	0.63	Slope	0.63
						Too sandy	0.50
Sharpsburg, moderately eroded	40	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Too clayey	0.50
		Too clayey	0.50				
370:							
Sharpsburg	95	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
370B:							
Sharpsburg----------	80	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
371C2:							
Sharpsburg, moderately eroded--	65	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Nira, moderately eroded----------	30	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
		Too clayey	0.50			Too clayey	0.50
371D2:							
Sharpsburg----------	45	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Too clayey	0.50
		Too clayey	0.50				
Sharpsburg, moderately eroded--	20	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Too clayey	0.50
		Too clayey	0.50				
Nira, moderately eroded----------	20	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Depth to saturated zone	0.86
		Too clayey	0.50			Too clayey	0.50
371E2:							
Sharpsburg, moderately eroded--	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep	1.00
		Too steep	1.00	Too steep	1.00	Too clayey	0.50
		Too clayey	0.50				
Nira, moderately eroded----------	10	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep	1.00
		Too steep	1.00	Too steep	1.00	Depth to saturated zone	0.86
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
431B:							
Judson	50	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Ackmore, rarely flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
Colo, frequently flooded, overwash	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
435:							
Zook, occasionally flooded	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
Mt. Sterling, occasionally flooded	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
469C2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Clarinda, moderately eroded	30	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00
						Hard to compact	1.00
Shelby, moderately eroded	20	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
469C3:							
Lamoni, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Clarinda, severely eroded	30	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00
						Hard to compact	1.00
Shelby, severely eroded	20	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Shelby, moderately eroded	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
509B:							
Marshall, terrace	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
509C:							
Marshall, terrace	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
509C2:							
Marshall, terrace, moderately eroded	95	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
545B:							
Zook	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
Ely	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Gullied land	20	Not rated		Not rated		Not rated	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
733:							
Calco, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone		Too clayey	0.50
		Too clayey	0.50				
803:							
Melia, terrace	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
824E3:							
Shelby, severely eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
870B:							
Sharpsburg, terrace	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
1239:							
Corley, terrace	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Minden, terrace	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
2428:							
Ely	45	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Colo, overwash	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Mt. Sterling	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Y8C:							
Judson	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Y24C2:							
Shelby, moderately eroded	60	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Y24D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Y24D3:							
Shelby, severely eroded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Y24E:							
Shelby	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Y24E2:							
Shelby, moderately eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Y24E3:							
Shelby, severely eroded	65	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Y24F2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Y24F3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Y82C3:							
Adair, severely eroded	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Shelby, severely eroded	25	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Y93D2:							
Shelby, moderately eroded	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Y93D3:							
Shelby, severely eroded	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Y93E2:							
Shelby, moderately eroded	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Y93E2:							
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Y192C2:							
Adair, moderately eroded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Y222C2:							
Clarinda, moderately eroded	75	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Too clayey	1.00
						Hard to compact	1.00
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63
Z8B:							
Judson	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Z8C:							
Judson	75	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Z24D2:							
Shelby, moderately eroded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Z24D3:							
Shelby, severely eroded	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Z24E2:							
Shelby, moderately eroded	50	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Z24E3:							
Shelby, severely eroded	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Z24F2:							
Shelby, moderately eroded	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Shelby, severely eroded	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Z93C2:							
Shelby, moderately eroded	40	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Z93D2:							
Shelby, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
Z93D2:							
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Z93E2:							
Shelby, moderately eroded	45	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too steep	1.00	Too steep	1.00	Too steep	1.00
		Too clayey	0.50			Too clayey	0.50
Z192C3:							
Adair, severely eroded	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Too clayey	0.50
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.63	Too clayey	1.00
		Slope	0.63			Hard to compact	1.00
						Slope	0.63

Construction Materials

The titles of the tables described in this section are:

- “Source of Gravel and Sand”
- “Source of Reclamation Material, Roadfill, and Topsoil”

These tables give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table “Source of Gravel and Sand,” only the likelihood 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 Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated as *improbable, possible, probable,* or *very likely* sources of gravel. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel. The number 0.00 indicates an improbable source; 0.01 to 0.39, a possible source; 0.40 to 0.99, a probable source; and 1.00, a very likely source.

The soils are rated *good, fair,* or *poor* as potential sources of sand. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. The larger the number, the greater the likelihood that the layer is a source of sand.

In the table “Source of Reclamation Material, Roadfill, and Topsoil,” the rating class terms are *good, fair,* and *poor*. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

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 whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a 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 AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

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. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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.

Source of Gravel and Sand

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
7:					
Wiota, rarely flooded	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7B:					
Wiota, rarely flooded	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9:					
Marshall	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9B:					
Marshall	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9C2:					
Marshall, moderately eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9C3:					
Marshall, severely eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9D2:					
Marshall, moderately eroded	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
15B:					
Olmitz	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ely	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
15B:					
Zook	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
16:					
Nodaway, occasionally flooded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kennebec, occasionally flooded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
43:					
Bremer, rarely flooded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
54:					
Zook, occasionally flooded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
54+:					
Zook, occasionally flooded, overwash	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
88:					
Nevin, rarely flooded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
99D2:					
Exira, moderately eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
99D3:					
Exira, severely eroded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
99E2:					
Exira, moderately eroded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
99E3:					
Exira, severely eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
113B:					
Colo, frequently flooded, overwash	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ely	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
136:					
Ankeny, occasionally flooded	95	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
212:					
Kennebec, occasionally flooded	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
220:					
Nodaway, occasionally flooded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
229C2:					
Clarinda, moderately eroded	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Clarinda, severely eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
229D2:					
Clarinda, moderately eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Clarinda, severely eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
247D2:					
Shelby, sandy substratum, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hesch, deep, moderately eroded	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Hesch, moderately eroded	20	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
269:					
Humeston, occasionally flooded, occasionally ponded	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
273B:					
Olmitz	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
289D2:					
Dickman, loamy substratum, moderately eroded	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
Marshall, moderately eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
300:					
Bremer, terrace	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
337D2:					
Dickman, loamy substratum, moderately eroded	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.07
Sharpsburg, moderately eroded	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
370:					
Sharpsburg	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
370B:					
Sharpsburg	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
371C2:					
Sharpsburg, moderately eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nira, moderately eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
371D2:					
Sharpsburg	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sharpsburg, moderately eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nira, moderately eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
371E2:					
Sharpsburg, moderately eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nira, moderately eroded	10	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
430:					
Ackmore, occasionally flooded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
431B:					
Judson	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
431B:					
Ackmore, rarely flooded	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colo, frequently flooded, overwash	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
435:					
Zook, occasionally flooded	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mt. Sterling, occasionally flooded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
469C2:					
Lamoni, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Clarinda, moderately eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shelby, moderately eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
469C3:					
Lamoni, severely eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Clarinda, severely eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shelby, severely eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
470D2:					
Lamoni, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
470D2:					
Shelby, moderately eroded	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
509B:					
Marshall, terrace	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
509C:					
Marshall, terrace	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
509C2:					
Marshall, terrace, moderately eroded	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
545B:					
Zook	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ely	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gullied land	20	Not rated		Not rated	
733:					
Calco, occasionally flooded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
803:					
Melia, terrace	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
824E3:					
Shelby, severely eroded	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lamoni, severely eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
870B:					
Sharpsburg, terrace	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
1239:					
Corley, terrace	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Minden, terrace	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2428:					
Ely	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colo, overwash	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mt. Sterling	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4946C:					
Udorthents	65	Not rated		Not rated	
Interstate highway	30	Not rated		Not rated	
5030:					
Pits, limestone quarry	100	Not rated		Not rated	
5040:					
Udorthents, loamy	100	Not rated		Not rated	
5080:					
Udorthents, sanitary landfill	100	Not rated		Not rated	
AW:					
Animal waste lagoon	100	Not rated		Not rated	
SL:					
Sewage lagoon	100	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	
Y8B:					
Judson	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y8C:					
Judson	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
Y24C2:					
Shelby, moderately eroded	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24D2:					
Shelby, moderately eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24D3:					
Shelby, severely eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24E:					
Shelby	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24E2:					
Shelby, moderately eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24E3:					
Shelby, severely eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24F2:					
Shelby, moderately eroded	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y24F3:					
Shelby, severely eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y82C3:					
Adair, severely eroded	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shelby, severely eroded	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
Y93D2:					
Shelby, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, moderately eroded	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y93D3:					
Shelby, severely eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, severely eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y93E2:					
Shelby, moderately eroded	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, moderately eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y192C2:					
Adair, moderately eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y192D2:					
Adair, moderately eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y222C2:					
Clarinda, moderately eroded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Y222D2:					
Clarinda, moderately eroded	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
Y222D3:					
Clarinda, severely eroded	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z8B:					
Judson	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z8C:					
Judson	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z24D2:					
Shelby, moderately eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z24D3:					
Shelby, severely eroded	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z24E2:					
Shelby, moderately eroded	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z24E3:					
Shelby, severely eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z24F2:					
Shelby, moderately eroded	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z82D3:					
Adair, severely eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shelby, severely eroded	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
Z93C2:					
Shelby, moderately eroded	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z93D2:					
Shelby, moderately eroded	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, moderately eroded	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z93E2:					
Shelby, moderately eroded	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Adair, moderately eroded	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z192C3:					
Adair, severely eroded	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Z222D2:					
Clarinda, moderately eroded	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Reclamation Material, Roadfill, and Topsoil

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.87		
7B:							
Wiota, rarely flooded	85	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.87		
9:							
Marshall	90	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.88	Shrink-swell	0.87		
9B:							
Marshall	100	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.88	Shrink-swell	0.87		
9C2:							
Marshall, moderately eroded	80	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.92	Shrink-swell	0.87		
		Too acid	0.97				
9C3:							
Marshall, severely eroded	80	Fair		Poor		Good	
		Water erosion	0.68	Low strength	0.00		
		Low content of organic matter	0.60	Shrink-swell	0.87		
		Too acid	0.97				
9D2:							
Marshall, moderately eroded	70	Fair		Poor		Fair	
		Water erosion	0.90	Low strength	0.00	Slope	0.37
		Low content of organic matter	0.92	Shrink-swell	0.87		
		Too acid	0.97				
15B:							
Olmitz	35	Fair		Poor		Good	
		Too acid	0.97	Low strength	0.00		
				Shrink-swell	0.87		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
15B:							
Ely	30	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
		Too clayey	0.98	Low strength	0.00	Too clayey	0.98
				Shrink-swell	0.87		
Zook	20	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.25		
16:							
Nodaway, occasionally flooded	55	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.68				
Kennebec, occasionally flooded	35	Fair		Poor		Good	
		Water erosion	0.99	Low strength	0.00		
43:							
Bremer, rarely flooded	80	Fair		Poor		Poor	
		Too clayey	0.01	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.69		
54:							
Zook, occasionally flooded	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.25		
54+:							
Zook, occasionally flooded, overwash	80	Fair		Poor		Poor	
		Water erosion	0.90	Wetness	0.00	Wetness	0.00
		Too clayey	0.12	Low strength	0.00	Too clayey	0.12
				Shrink-swell	0.17		
88:							
Nevin, rarely flooded	90	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
		Too acid	0.84	Low strength	0.00		
				Shrink-swell	0.87		
99D2:							
Exira, moderately eroded	65	Fair		Poor		Fair	
		Low content of organic matter	0.18	Low strength	0.00	Slope	0.37
		Water erosion	0.68	Shrink-swell	0.87		
		Too acid	0.88				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
99D3:							
Exira, severely eroded	75	Fair		Poor		Fair	
		Low content of organic matter	0.32	Low strength	0.00	Slope	0.37
		Water erosion	0.68	Shrink-swell	0.87		
		Too acid	0.88				
99E2:							
Exira, moderately eroded	75	Fair		Poor		Poor	
		Low content of organic matter	0.18	Low strength	0.00	Slope	0.00
		Water erosion	0.68	Shrink-swell	0.87		
		Too acid	0.88	Slope	0.98		
99E3:							
Exira, severely eroded	80	Fair		Poor		Poor	
		Low content of organic matter	0.32	Low strength	0.00	Slope	0.00
		Water erosion	0.68	Shrink-swell	0.87		
		Too acid	0.88	Slope	0.98		
113B:							
Colo, frequently flooded, overwash	50	Fair		Poor		Poor	
		Too clayey	0.88	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Too clayey	0.88
				Shrink-swell	0.87		
Ely	25	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
		Too clayey	0.98	Low strength	0.00	Too clayey	0.98
				Shrink-swell	0.87		
136:							
Ankeny, occasionally flooded	95	Good		Good		Good	
212:							
Kennebec, occasionally flooded	70	Fair		Poor		Good	
		Water erosion	0.99	Low strength	0.00		
220:							
Nodaway, occasionally flooded	75	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.68				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
229C2:							
Clarinda, moderately eroded--	40	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00		
		Too acid	0.97				
Clarinda, severely eroded----------	20	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00		
229D2:							
Clarinda, moderately eroded--	55	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.37
		Too acid	0.97				
Clarinda, severely eroded----------	20	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Slope	0.37
247D2:							
Shelby, sandy substratum, moderately eroded--	35	Fair		Fair		Fair	
		Water erosion	0.90	Shrink-swell	0.87	Slope	0.37
		Low content of organic matter	0.50			Too clayey	0.44
		Too clayey	0.68			Rock fragments	0.96
		Too acid	0.68			Gravel content	0.96
Hesch, deep, moderately eroded--	25	Fair		Good		Fair	
		Low content of organic matter	0.12			Slope	0.37
		Water erosion	0.99			Rock fragments	0.96
		Too acid	0.95			Gravel content	0.96
Hesch, moderately eroded----------	20	Fair		Good		Fair	
		Too sandy	0.01			Too sandy	0.01
		Low content of organic matter	0.12			Slope	0.37
		Droughty	0.33			Rock fragments	0.98
		Too acid	0.68			Gravel content	0.98

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Fair		Poor		Poor	
		Water erosion	0.68	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00		
				Shrink-swell	0.43		
273B:							
Olmitz	80	Fair		Poor		Good	
		Too acid	0.97	Low strength	0.00		
				Shrink-swell	0.87		
289D2:							
Dickman, loamy substratum, moderately eroded	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Low content of organic matter	0.12			Slope	0.37
		Too acid	0.84				
Marshall, moderately eroded	30	Fair		Poor		Fair	
		Water erosion	0.90	Low strength	0.00	Slope	0.37
		Low content of organic matter	0.92	Shrink-swell	0.87		
		Too acid	0.97				
300:							
Bremer, terrace	90	Fair		Poor		Poor	
		Too clayey	0.01	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.69		
337D2:							
Dickman, loamy substratum, moderately eroded	45	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Low content of organic matter	0.12			Slope	0.37
		Too acid	0.84				
Sharpsburg, moderately eroded	40	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.37
				Shrink-swell	0.73	Too clayey	0.44
		Water erosion	0.90				
		Too clayey	0.68				
		Too acid	0.74				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
370:							
Sharpsburg----------	95	Fair		Poor		Poor	
		Too clayey	0.01	Low strength	0.00	Too clayey	0.00
		Water erosion	0.68	Shrink-swell	0.69		
		Too acid	0.88				
		Low content of organic matter	0.92				
370B:							
Sharpsburg----------	80	Fair		Poor		Poor	
		Too clayey	0.01	Low strength	0.00	Too clayey	0.00
		Water erosion	0.68	Shrink-swell	0.69		
		Too acid	0.88				
		Low content of organic matter	0.92				
371C2:							
Sharpsburg, moderately eroded--	65	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.44
		Water erosion	0.90	Shrink-swell	0.73		
		Too clayey	0.68				
		Too acid	0.74				
Nira, moderately eroded----------	30	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Wetness	0.53
		Water erosion	0.90	Wetness	0.53	Too clayey	0.53
		Too clayey	0.92	Shrink-swell	0.87		
371D2:							
Sharpsburg----------	45	Fair		Poor		Poor	
		Too clayey	0.01	Low strength	0.00	Too clayey	0.00
		Water erosion	0.68	Shrink-swell	0.69	Slope	0.37
		Too acid	0.88				
		Low content of organic matter	0.92				
Sharpsburg, moderately eroded--	20	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.37
		Water erosion	0.90	Shrink-swell	0.73	Too clayey	0.44
		Too clayey	0.68				
		Too acid	0.74				
Nira, moderately eroded----------	20	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Wetness	0.53
		Water erosion	0.90	Wetness	0.53	Slope	0.37
		Too clayey	0.92	Shrink-swell	0.87	Too clayey	0.53

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
371E2:							
Sharpsburg, moderately eroded	55	Fair		Poor		Poor	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Shrink-swell	0.73	Too clayey	0.44
		Too clayey	0.68	Slope	0.98		
		Too acid	0.74				
Nira, moderately eroded	10	Fair		Poor		Poor	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Wetness	0.53	Wetness	0.53
		Too clayey	0.92	Shrink-swell	0.87	Too clayey	0.53
				Slope	0.98		
430:							
Ackmore, occasionally flooded	75	Fair		Poor		Poor	
		Water erosion	0.90	Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Shrink-swell	0.33		
431B:							
Judson	50	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Too acid	0.84				
Ackmore, rarely flooded	25	Fair		Poor		Poor	
		Water erosion	0.90	Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Shrink-swell	0.33		
Colo, frequently flooded, overwash	15	Fair		Poor		Poor	
		Too clayey	0.88	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Too clayey	0.88
				Shrink-swell	0.87		
435:							
Zook, occasionally flooded	40	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.25		
Mt. Sterling, occasionally flooded	35	Fair		Poor		Poor	
		Water erosion	0.37	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50	Low strength	0.00		
		Too acid	0.97	Shrink-swell	0.34		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
469C2:							
Lamoni, moderately eroded	35	Poor		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Too clayey	0.00
		Too clayey	0.00	Shrink-swell	0.71		
		Too acid	0.97				
Clarinda, moderately eroded	30	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00		
		Too acid	0.97				
Shelby, moderately eroded	20	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Too clayey	0.72
		Too acid	0.95	Shrink-swell	0.87	Rock fragments	0.92
						Gravel content	0.92
469C3:							
Lamoni, severely eroded	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too clayey	0.68	Low strength	0.00	Too clayey	0.39
		Too acid	0.97	Shrink-swell	0.83		
Clarinda, severely eroded	30	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00		
Shelby, severely eroded	20	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.44
		Too clayey	0.68	Shrink-swell	0.87	Rock fragments	0.96
		Too acid	0.97			Gravel content	0.96
470D2:							
Lamoni, moderately eroded	35	Poor		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.37
		Too clayey	0.00	Shrink-swell	0.71	Too clayey	0.00
		Too acid	0.97				
Shelby, moderately eroded	25	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Slope	0.37
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
						Rock fragments	0.92
						Gravel content	0.92

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
509B:							
Marshall, terrace	90	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.88	Shrink-swell	0.87		
509C:							
Marshall, terrace	90	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.88	Shrink-swell	0.87		
509C2:							
Marshall, terrace, moderately eroded	95	Fair		Poor		Fair	
		Water erosion	0.99	Low strength	0.00	Too clayey	0.86
		Too clayey	0.98	Shrink-swell	0.87		
545B:							
Zook	35	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.25		
Ely	30	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
		Too clayey	0.98	Low strength	0.00	Too clayey	0.98
				Shrink-swell	0.87		
Gullied land	20	Not rated		Not rated		Not rated	
733:							
Calco, occasionally flooded	90	Fair		Poor		Poor	
		Carbonate content	0.92	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Carbonate content	0.92
				Shrink-swell	0.87		
803:							
Melia, terrace	90	Good		Poor		Good	
				Low strength	0.00		
824E3:							
Shelby, severely eroded	50	Fair		Poor		Poor	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.44
		Too clayey	0.68	Slope	0.98	Rock fragments	0.96
		Too acid	0.97			Gravel content	0.96
Lamoni, severely eroded	30	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Slope	0.00
		Too clayey	0.68	Shrink-swell	0.83	Too clayey	0.39
		Too acid	0.97	Slope	0.98		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
870B:							
Sharpsburg, terrace	85	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too clayey	0.02
		Water erosion	0.68	Shrink-swell	0.56		
		Low content of organic matter	0.50				
		Too acid	0.84				
1239:							
Corley, terrace	60	Fair		Poor		Poor	
		Water erosion	0.68	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.40		
Minden, terrace	30	Fair		Poor		Poor	
		Water erosion	0.90	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.88	Low strength	0.00	Too clayey	0.66
		Too clayey	0.92	Shrink-swell	0.87		
2428:							
Ely	45	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
		Too clayey	0.98	Low strength	0.00	Too clayey	0.98
				Shrink-swell	0.87		
Colo, overwash	25	Fair		Poor		Poor	
		Too clayey	0.88	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Too clayey	0.88
				Shrink-swell	0.87		
Mt. Sterling	20	Fair		Poor		Poor	
		Water erosion	0.37	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50	Low strength	0.00		
		Too acid	0.97	Shrink-swell	0.34		
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Not rated	
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Too acid	0.84				
Y8C:							
Judson	85	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Too acid	0.84				
Y24C2:							
Shelby, moderately eroded	60	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Too clayey	0.72
		Too acid	0.95	Shrink-swell	0.87	Rock fragments	0.92
						Gravel content	0.92
Y24D2:							
Shelby, moderately eroded	65	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Slope	0.37
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
						Rock fragments	0.92
						Gravel content	0.92
Y24D3:							
Shelby, severely eroded	55	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.37
				Shrink-swell	0.87	Too clayey	0.44
		Too clayey	0.68			Rock fragments	0.96
		Too acid	0.97			Gravel content	0.96
Y24E:							
Shelby	60	Fair		Poor		Poor	
		Too clayey	0.76	Low strength	0.00	Slope	0.00
		Too acid	0.88	Shrink-swell	0.87	Too clayey	0.60
				Slope	0.98	Rock fragments	0.92
						Gravel content	0.92
Y24E2:							
Shelby, moderately eroded	55	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
				Slope	0.98	Rock fragments	0.92
						Gravel content	0.92

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Y24E3:							
Shelby, severely eroded	65	Fair		Poor		Poor	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.00
		Too clayey	0.68	Shrink-swell	0.87	Too clayey	0.44
		Too acid	0.97	Slope	0.98	Rock fragments	0.96
						Gravel content	0.96
Y24F2:							
Shelby, moderately eroded	50	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Slope	0.18	Too clayey	0.72
				Shrink-swell	0.87	Rock fragments	0.92
						Gravel content	0.92
Y24F3:							
Shelby, severely eroded	55	Fair		Poor		Poor	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.00
				Slope	0.18	Too clayey	0.44
		Too clayey	0.68	Shrink-swell	0.87	Rock fragments	0.96
		Too acid	0.97			Gravel content	0.96
Y82C3:							
Adair, severely eroded	60	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.66	Rock fragments	0.88
		Water erosion	0.99			Gravel content	0.88
		Too acid	0.84				
Shelby, severely eroded	25	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.44
				Shrink-swell	0.87	Rock fragments	0.96
		Too clayey	0.68			Gravel content	0.96
		Too acid	0.97				
Y93D2:							
Shelby, moderately eroded	35	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Slope	0.37
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
						Rock fragments	0.92
						Gravel content	0.92
Adair, moderately eroded	25	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Slope	0.37
		Water erosion	0.99	Shrink-swell	0.71	Too clayey	0.39
		Too clayey	0.68			Rock fragments	0.96
		Too acid	0.84			Gravel content	0.96

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Y93D3:							
Shelby, severely eroded	35	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.37
		Too clayey	0.68	Shrink-swell	0.87	Too clayey	0.44
		Too acid	0.97			Rock fragments	0.96
						Gravel content	0.96
Adair, severely eroded	30	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
		Water erosion	0.99	Shrink-swell	0.66	Slope	0.37
		Too acid	0.84			Rock fragments	0.88
						Gravel content	0.88
Y93E2:							
Shelby, moderately eroded	40	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
				Slope	0.98	Rock fragments	0.92
						Gravel content	0.92
Adair, moderately eroded	30	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.00
		Too clayey	0.68	Shrink-swell	0.71	Too clayey	0.39
		Too acid	0.84	Slope	0.98	Rock fragments	0.96
		Carbonate content	0.92			Gravel content	0.96
Y192C2:							
Adair, moderately eroded	65	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Too clayey	0.39
		Too clayey	0.68	Shrink-swell	0.47	Rock fragments	0.96
		Too acid	0.84			Gravel content	0.96
Y192D2:							
Adair, moderately eroded	55	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.37
		Too clayey	0.68	Shrink-swell	0.71	Too clayey	0.39
		Too acid	0.84			Rock fragments	0.96
						Gravel content	0.96
Y222C2:							
Clarinda, moderately eroded	75	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00		
		Too acid	0.97				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Y222D2:							
Clarinda, moderately eroded	60	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.37
		Too acid	0.97				
Y222D3:							
Clarinda, severely eroded	70	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Slope	0.37
Z8B:							
Judson	80	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Too acid	0.84				
Z8C:							
Judson	75	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Low content of organic matter	0.68	Shrink-swell	0.87		
		Too acid	0.84				
Z24D2:							
Shelby, moderately eroded	55	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Slope	0.37
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
						Rock fragments	0.92
						Gravel content	0.92
Z24D3:							
Shelby, severely eroded	85	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.37
		Too clayey	0.68	Shrink-swell	0.87	Too clayey	0.44
		Too acid	0.97			Rock fragments	0.96
						Gravel content	0.96
Z24E2:							
Shelby, moderately eroded	50	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
				Slope	0.98	Rock fragments	0.92
						Gravel content	0.92

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Z24E3:							
Shelby, severely eroded	55	Fair		Poor		Poor	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.00
		Too clayey	0.68	Shrink-swell	0.87	Too clayey	0.44
		Too acid	0.97	Slope	0.98	Rock fragments	0.96
						Gravel content	0.96
Z24F2:							
Shelby, moderately eroded	60	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Slope	0.18	Too clayey	0.72
				Shrink-swell	0.87	Rock fragments	0.92
						Gravel content	0.92
Z82D3:							
Adair, severely eroded	35	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.66	Slope	0.37
		Water erosion	0.99			Rock fragments	0.88
		Too acid	0.84			Gravel content	0.88
Shelby, severely eroded	30	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Slope	0.37
				Shrink-swell	0.87	Too clayey	0.44
		Too clayey	0.68			Rock fragments	0.96
		Too acid	0.97			Gravel content	0.96
Z93C2:							
Shelby, moderately eroded	40	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Too clayey	0.72
		Too acid	0.95	Shrink-swell	0.87	Rock fragments	0.92
						Gravel content	0.92
Adair, moderately eroded	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Too clayey	0.39
		Water erosion	0.99	Shrink-swell	0.71	Rock fragments	0.96
		Too clayey	0.68			Gravel content	0.96
		Too acid	0.84				
Z93D2:							
Shelby, moderately eroded	65	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Slope	0.37
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
						Rock fragments	0.92
						Gravel content	0.92

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
Z93D2:							
Adair, moderately eroded	20	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Slope	0.37
		Too clayey	0.68	Shrink-swell	0.71	Too clayey	0.39
		Too acid	0.84			Rock fragments	0.96
						Gravel content	0.96
Z93E2:							
Shelby, moderately eroded	45	Fair		Poor		Poor	
		Too clayey	0.92	Low strength	0.00	Slope	0.00
		Too acid	0.95	Shrink-swell	0.87	Too clayey	0.72
				Slope	0.98	Rock fragments	0.92
						Gravel content	0.92
Z192C3:							
Adair, severely eroded	55	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.66	Rock fragments	0.88
		Water erosion	0.99			Gravel content	0.88
		Too acid	0.84				
Z222D2:							
Clarinda, moderately eroded	70	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
				Low strength	0.00	Slope	0.37
		Water erosion	0.99				
		Too acid	0.97				

Water Management

The table “Ponds and Embankments” 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; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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. Embankments that have zoned construction (core and shell) are not considered. 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.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Ponds and Embankments

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
7:							
Wiota, rarely flooded	85	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.70			Slow refill	0.30
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10
7B:							
Wiota, rarely flooded	85	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.70			Slow refill	0.30
		Slope	0.08			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
9:							
Marshall	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
9B:							
Marshall	100	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
		Slope	0.08				
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
9C3:							
Marshall, severely eroded	80	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
9D2:							
Marshall, moderately eroded	70	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
15B:							
Olmitz	35	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.24			Slow refill	0.76
		Slope	0.08			Depth to saturated zone	0.81
						Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
15B:							
Ely	30	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.24	Depth to saturated zone	1.00	Slow refill	0.76
		Slope	0.08			Unstable excavation walls	0.10
Zook	20	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
		Slope	0.08	Hard to pack	0.18	Unstable excavation walls	0.10
16:							
Nodaway, occasionally flooded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.24	Piping	0.08	Slow refill	0.76
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10
Kennebec, occasionally flooded	35	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Slow refill	0.30
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10
43:							
Bremer, rarely flooded	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
				Hard to pack	0.11	Unstable excavation walls	0.10
54:							
Zook, occasionally flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
				Hard to pack	0.18	Unstable excavation walls	0.10
54+:							
Zook, occasionally flooded, overwash	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.76
						Unstable excavation walls	0.10
88:							
Nevin, rarely flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
						Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
99D2:							
Exira, moderately eroded	65	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.08	Depth to water	1.00
		Seepage	0.70				
99D3:							
Exira, severely eroded	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.06	Depth to water	1.00
		Seepage	0.70				
99E2:							
Exira, moderately eroded	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.08	Depth to water	1.00
		Seepage	0.70				
99E3:							
Exira, severely eroded	80	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.06	Depth to water	1.00
		Seepage	0.70				
113B:							
Colo, frequently flooded, overwash	50	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
Ely	25	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.24	Depth to saturated zone	1.00	Slow refill	0.76
						Unstable excavation walls	0.10
136:							
Ankeny, occasionally flooded	95	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
212:							
Kennebec, occasionally flooded	70	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Slow refill	0.30
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
220:							
Nodaway, occasionally flooded	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.24	Piping	0.08	Slow refill	0.76
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10
229C2:							
Clarinda, moderately eroded	40	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Clarinda, severely eroded	20	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
229D2:							
Clarinda, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Clarinda, severely eroded	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
247D2:							
Shelby, sandy substratum, moderately eroded	35	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.31	Depth to water	1.00
		Seepage	1.00				
Hesch, deep, moderately eroded	25	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.13	Depth to water	1.00
		Seepage	1.00				
Hesch, moderately eroded	20	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.91	Depth to water	1.00
		Seepage	1.00				
		Depth to bedrock	0.17				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
269:							
Humeston, occasionally flooded, occasionally ponded	100	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
				Ponding	1.00	Unstable excavation walls	0.10
273B:							
Olmitz	80	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.05			Slow refill	0.95
		Slope	0.08			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
289D2:							
Dickman, loamy substratum, moderately eroded	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.17	Depth to water	1.00
		Slope	1.00				
Marshall, moderately eroded	30	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
300:							
Bremer, terrace	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
				Hard to pack	0.11	Unstable excavation walls	0.10
337D2:							
Dickman, loamy substratum, moderately eroded	45	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Sharpsburg, moderately eroded	40	Very limited		Not limited		Somewhat limited	
		Slope	1.00			Slow refill	0.95
		Seepage	0.05			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
370:							
Sharpsburg	95	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.05			Slow refill	0.95
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
370B:							
Sharpsburg	80	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.05			Slow refill	0.95
		Slope	0.08			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
371C2:							
Sharpsburg, moderately eroded	65	Somewhat limited		Not limited		Somewhat limited	
		Slope	0.92			Slow refill	0.95
		Seepage	0.05			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
Nira, moderately eroded	30	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.92	Depth to saturated zone	1.00	Slow refill	0.76
		Seepage	0.24			Unstable excavation walls	0.10
371D2:							
Sharpsburg	45	Very limited		Not limited		Somewhat limited	
		Slope	1.00			Slow refill	0.95
		Seepage	0.05			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
Sharpsburg, moderately eroded	20	Very limited		Not limited		Somewhat limited	
		Slope	1.00			Slow refill	0.95
		Seepage	0.05			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
Nira, moderately eroded	20	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.76
		Seepage	0.24			Unstable excavation walls	0.10
371E2:							
Sharpsburg, moderately eroded	55	Very limited		Not limited		Somewhat limited	
		Slope	1.00			Slow refill	0.95
		Seepage	0.05			Depth to saturated zone	0.81
						Unstable excavation walls	0.10
Nira, moderately eroded	10	Very limited		Very limited		Somewhat limited	
		Slope	1.00	Depth to saturated zone	1.00	Slow refill	0.76
		Seepage	0.24			Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
430:							
Ackmore, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
431B:							
Judson	50	Somewhat limited		Not limited		Very limited	
		Seepage	0.05			Depth to water	1.00
		Slope	0.08				
Ackmore, rarely flooded	25	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
Colo, frequently flooded, overwash	15	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
435:							
Zook, occasionally flooded	40	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
				Hard to pack	0.18	Unstable excavation walls	0.10
Mt. Sterling, occasionally flooded	35	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
469C2:							
Lamoni, moderately eroded	35	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Clarinda, moderately eroded	30	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Shelby, moderately eroded	20	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
469C3:							
Lamoni, severely eroded	35	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Clarinda, severely eroded	30	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Shelby, severely eroded	20	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
470D2:							
Lamoni, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Shelby, moderately eroded	25	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
509B:							
Marshall, terrace	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00
		Slope	0.08				
509C:							
Marshall, terrace	90	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.70				
509C2:							
Marshall, terrace, moderately eroded	95	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
545B:							
Zook	35	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
		Slope	0.08			Unstable excavation walls	0.10
				Hard to pack	0.18		
Ely	30	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.24	Depth to saturated zone	1.00	Slow refill	0.76
		Slope	0.08			Unstable excavation walls	0.10
Gullied land	20	Not rated		Not rated		Not rated	

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
733:							
Calco, occasionally flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
						Unstable excavation walls	0.10
803:							
Melia, terrace	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.05			Depth to water	1.00
824E3:							
Shelby, severely eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Lamoni, severely eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
870B:							
Sharpsburg, terrace	85	Somewhat limited		Not limited		Somewhat limited	
		Seepage	0.05			Slow refill	0.95
						Depth to saturated zone	0.81
						Unstable excavation walls	0.10
1239:							
Corley, terrace	60	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
Minden, terrace	30	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
2428:							
Ely	45	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.24	Depth to saturated zone	1.00	Slow refill	0.76
						Unstable excavation walls	0.10
Colo, overwash	25	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10
Mt. Sterling	20	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Slow refill	0.30
						Unstable excavation walls	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
4946C:							
Udorthents	65	Not rated		Not rated		Not rated	
Interstate highway	30	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarry	100	Not rated		Not rated		Not rated	
5040:							
Udorthents, loamy	100	Not rated		Not rated		Very limited	
						Depth to water	1.00
5080:							
Udorthents, sanitary landfill	100	Not rated		Not rated		Very limited	
						Depth to water	1.00
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	
Y8B:							
Judson	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.05			Depth to water	1.00
		Slope	0.08				
Y8C:							
Judson	85	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
Y24C2:							
Shelby, moderately eroded	60	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
Y24D2:							
Shelby, moderately eroded	65	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y24D3:							
Shelby, severely eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y24E:							
Shelby	60	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
Y24E2:							
Shelby, moderately eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y24E3:							
Shelby, severely eroded	65	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y24F2:							
Shelby, moderately eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y24F3:							
Shelby, severely eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Y82C3:							
Adair, severely eroded	60	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Shelby, severely eroded	25	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
Y93D2:							
Shelby, moderately eroded	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Adair, moderately eroded	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Y93D3:							
Shelby, severely eroded	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Adair, severely eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
Y93E2:							
Shelby, moderately eroded	40	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Adair, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Y192C2:							
Adair, moderately eroded	65	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
Y192D2:							
Adair, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Y222C2:							
Clarinda, moderately eroded	75	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Y222D2:							
Clarinda, moderately eroded	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Y222D3:							
Clarinda, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		
Z8B:							
Judson	80	Somewhat limited		Not limited		Very limited	
		Seepage	0.05			Depth to water	1.00
		Slope	0.08				
Z8C:							
Judson	75	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
Z24D2:							
Shelby, moderately eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
Z24D3:							
Shelby, severely eroded	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Z24E2:							
Shelby, moderately eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Z24E3:							
Shelby, severely eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Z24F2:							
Shelby, moderately eroded	60	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Z82D3:							
Adair, severely eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Shelby, severely eroded	30	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Z93C2:							
Shelby, moderately eroded	40	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.05				
Adair, moderately eroded	35	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Z93D2:							
Shelby, moderately eroded	65	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Adair, moderately eroded	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
Z93E2:							
Shelby, moderately eroded	45	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Adair, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Z192C3:							
Adair, severely eroded	55	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Depth to saturated zone	1.00	Depth to water	1.00
		Seepage	0.05				
Z222D2:							
Clarinda, moderately eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.92		

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

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 particle-size distribution, plasticity, and compaction characteristics.

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

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Properties

The table described in this section gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

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

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

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

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

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

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

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

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

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487–00.

Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
7:												
Wiota, rarely flooded--------	0-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	92-100	87-99	38-52	13-22
	8-28	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	92-100	87-99	37-51	13-22
	28-59	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	41-49	21-25
	59-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	94-100	35-46	17-24
7B:												
Wiota, rarely flooded--------	0-8	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	92-100	87-99	38-52	13-22
	8-28	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	92-100	87-99	37-51	13-22
	28-59	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	41-49	21-25
	59-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	94-100	35-46	17-24
9:												
Marshall--------	0-7	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	93-100	92-100	41-53	17-25
	7-22	Silty clay loam	CL	A-7-6	0	0	100	100	94-100	92-100	41-52	18-25
	22-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	96-100	95-100	36-48	18-25
	65-71	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-42	17-21
	71-80	Silty clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-41	17-21
9B:												
Marshall--------	0-7	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	93-100	92-100	41-53	17-25
	7-22	Silty clay loam	CL	A-7-6	0	0	100	100	94-100	92-100	41-52	18-25
	22-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	96-100	95-100	36-48	18-25
	65-71	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-42	17-21
	71-80	Silty clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-41	17-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
9C2:												
Marshall, moderately eroded---------	0-7	Silty clay loam	CL	A-7	0	0	100	100	95-100	93-100	41-52	19-25
	7-50	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	38-47	19-25
	50-62	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
	62-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
9C3:												
Marshall, severely eroded	0-5	Silty clay loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	39-50	19-25
	5-41	Silty clay loam	CL	A-7, A-6	0	0	100	100	97-100	96-100	38-47	19-25
	41-50	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
	50-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-47	17-25
9D2:												
Marshall, moderately eroded---------	0-7	Silty clay loam	CL	A-7	0	0	100	100	95-100	93-100	41-52	19-25
	7-50	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	38-47	19-25
	50-62	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
	62-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
15B:												
Olmitz----------	0-7	Loam	CL	A-6	0	0	100	90-100	79-91	59-68	40-47	16-19
	7-30	Clay loam, loam	CL	A-6	0	0	100	90-100	76-97	58-77	37-50	15-24
	30-60	Clay loam	CL	A-6, A-7	0	0	100	90-100	79-94	61-74	39-48	19-24
Ely----------	0-8	Silty clay loam, silt loam	CL	A-7	0	0	100	100	90-100	84-99	39-56	13-24
	8-32	Silty clay loam	CL	A-7	0	0	100	100	94-100	88-96	45-55	18-25
	32-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	88-96	39-51	19-25
	58-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	89-100	83-100	30-47	12-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
15B:												
Zook	0-7	Silty clay loam, silty clay	CH	A-7	0	0	100	100	98-100	93-100	51-68	22-32
	7-20	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	90-100	51-68	22-32
	20-38	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
	38-61	Silty clay loam, silty clay	CH	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	61-80	Silty clay loam, silty clay, silt loam	CL, CH	A-7, A-6	0	0	100	100	87-100	83-100	31-56	13-32
16:												
Nodaway, occasionally flooded	0-7	Silt loam, silty clay loam	CL	A-6	0	0	100	95-100	87-100	83-100	30-48	11-24
	7-80	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6	0	0	100	95-100	86-100	82-100	29-46	12-25
Kennebec, occasionally flooded	0-8	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	8-54	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	54-80	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
43:												
Bremer, rarely flooded	0-8	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
	8-19	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
	19-42	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	89-99	47-59	25-33
	42-50	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	40-51	21-29
	50-60	Silty clay loam	CH, CL	A-7	0	0	100	100	91-100	82-97	36-51	17-29

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
54:												
Zook, occasionally flooded--------	0-7	Silty clay loam, silty clay	CH	A-7	0	0	100	100	98-100	93-100	51-68	22-32
	7-20	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	90-100	51-68	22-32
	20-38	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
	38-61	Silty clay loam, silty clay	CH	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	61-80	Silty clay loam, silty clay, silt loam	CL, CH	A-7, A-6	0	0	100	100	87-100	83-100	31-56	13-32
54+:												
Zook, occasionally flooded, overwash-------	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	86-98	35-46	13-18
	7-13	Silt loam	CL	A-6	0	0	100	100	95-100	86-98	35-46	13-18
	13-50	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	93-100	88-100	49-65	23-32
	50-58	Silty clay loam, silty clay	CH	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	58-80	Silty clay loam, silty clay, silt loam	CL, CH	A-7, A-6	0	0	100	100	87-100	83-100	31-56	13-32
88:												
Nevin, rarely flooded--------	0-8	Silty clay loam, silt loam	CL	A-7	0	0	100	100	97-100	93-96	42-51	17-20
	8-24	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-96	44-53	18-20
	24-46	Silty clay loam	CL	A-7	0	0	100	100	97-100	92-97	41-49	21-25
	46-62	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	89-100	35-47	17-26
99D2:												
Exira, moderately eroded---------	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	98-100	96-100	40-51	19-24
	6-33	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	36-47	17-25
	33-37	Silt loam	CL	A-6, A-7	0	0	100	100	100	99-100	35-46	17-25
	37-80	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	93-100	31-42	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
99D3:												
Exira, severely eroded---------	0-5	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	40-49	19-24
	5-36	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	97-100	96-100	35-46	17-25
	36-44	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	35-46	17-25
	44-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	94-100	31-42	13-21
99E2:												
Exira, moderately eroded---------	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	98-100	96-100	40-51	19-24
	6-33	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	36-47	17-25
	33-37	Silt loam	CL	A-6, A-7	0	0	100	100	100	99-100	35-46	17-25
	37-80	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	93-100	31-42	13-21
99E3:												
Exira, severely eroded---------	0-5	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	40-49	19-24
	5-36	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	97-100	96-100	35-46	17-25
	36-44	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	35-46	17-25
	44-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	94-100	31-42	13-21
113B:												
Colo, frequently flooded, overwash-------	0-7	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	7-15	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	15-50	Silty clay loam	CL, CH	A-7	0	0	100	100	97-100	93-98	45-53	21-25
	50-70	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	41-49	21-25
	70-80	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	39-47	21-25
Ely----------	0-8	Silty clay loam, silt loam	CL	A-7	0	0	100	100	90-100	84-99	39-56	13-24
	8-32	Silty clay loam	CL	A-7	0	0	100	100	94-100	88-96	45-55	18-25
	32-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	88-96	39-51	19-25
	58-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	89-100	83-100	30-47	12-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
136:												
Ankeny, occasionally flooded--------	0-7	Fine sandy loam	SC, SM, SC-SM	A-4, A-2	0	0-5	95-100	95-100	75-90	30-50	15-25	2-10
	7-30	Fine sandy loam	SC, SM, SC-SM	A-4, A-2	0	0-5	95-100	95-100	75-90	30-50	15-25	2-10
	30-44	Fine sandy loam, sandy loam	SC, SM, SC-SM	A-2, A-4	0	0-5	95-100	95-100	75-90	25-45	15-25	2-10
	44-60	Loamy sand, loamy fine sand, fine sandy loam, fine sand	SC, SC-SM, SM, SW-SM	A-2, A-4, A-3	0	0-5	95-100	95-100	70-80	5-40	15-25	NP-10
212:												
Kennebec, occasionally flooded--------	0-8	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	8-54	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	54-80	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
220:												
Nodaway, occasionally flooded--------	0-7	Silt loam, silty clay loam	CL	A-6	0	0	100	95-100	87-100	83-100	30-48	11-24
	7-80	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6	0	0	100	95-100	86-100	82-100	29-46	12-25
229C2:												
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Clarinda, severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
	4-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	49-69	29-44

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
229D2:												
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Clarinda, severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
	4-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	49-69	29-44
247D2:												
Shelby, sandy substratum, moderately eroded---------	0-5	Loam	CL	A-6	0	0	95-100	82-100	73-95	57-76	35-44	13-18
	5-33	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	33-51	Loam	CL	A-6	0	0-4	91-95	81-95	72-90	57-72	31-38	13-18
	51-80	Fine sandy loam	SC-SM	A-6	0	0-4	91-95	82-95	72-94	32-47	20-32	4-12
Hesch, deep, moderately eroded---------	0-7	Loam	CL	A-6	0	0	95-100	82-100	73-95	57-76	35-44	13-18
	7-18	Loam, sandy loam	SC-SM	A-4	0	0	100	100	80-96	54-70	22-38	6-18
	18-39	Fine sandy loam, sandy loam, loam	SC, SC-SM	A-4, A-2	0	0	95-100	79-100	70-97	30-46	20-30	6-12
	39-49	Loamy fine sand, sand, fine sand	SM	A-2, A-4	0	0	96-100	79-100	73-98	24-37	0-21	NP-4
	49-80	Bedrock	---	---	---	---	---	---	---	---	0-14	NP
Hesch, moderately eroded---------	0-9	Loam, sandy loam	ML, CL, CL-ML	A-4	0	0	95-100	78-100	62-96	44-74	25-43	6-18
	9-17	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-92	56-74	37-47	19-25
	17-28	Loamy fine sand, sand, fine sand	SM	A-2	0	0	96-100	79-100	74-97	23-34	0-19	NP-2
	28-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
269:												
Humeston, occasionally flooded, occasionally ponded---------	0-11	Silty clay loam, silt loam	CL	A-6	0	0	100	100	97-100	88-94	40-49	16-21
	11-25	Silt loam	CL	A-6	0	0	100	100	94-100	85-91	33-42	13-18
	25-31	Silty clay loam	CL	A-7	0	0	100	100	97-100	89-94	40-48	21-25
	31-72	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	94-100	90-100	47-61	25-35
	72-80	Silty clay loam	CL, CH	A-7	0	0	100	100	96-100	89-97	40-50	21-27
273B:												
Olmitz----------	0-7	Loam	CL	A-6	0	0	100	90-100	79-91	59-68	40-47	16-19
	7-30	Clay loam, loam	CL	A-6	0	0	100	90-100	76-97	58-77	37-50	15-24
	30-60	Clay loam	CL	A-6, A-7	0	0	100	90-100	79-94	61-74	39-48	19-24
289D2:												
Dickman, loamy substratum, moderately eroded---------	0-6	Fine sandy loam	SC-SM	A-4, A-2	0	0	95-100	90-100	80-97	32-44	22-33	6-12
	6-19	Fine sandy loam, sandy loam	SC, SC-SM	A-4, A-2	0	0	95-100	90-100	80-97	32-44	20-31	6-12
	19-46	Loamy fine sand	SM	A-2	0	0	95-100	90-100	82-97	21-29	15-23	1-6
	46-56	Fine sandy loam	SC-SM	A-2	0	0	95-100	90-100	80-97	32-44	20-30	6-12
	56-69	Fine sand	SM	A-2	0	0	95-100	91-100	83-97	15-22	15-23	1-6
	69-80	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	98-100	97-100	35-46	17-25
Marshall, moderately eroded---------	0-7	Silty clay loam	CL	A-7	0	0	100	100	95-100	93-100	41-52	19-25
	7-50	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	38-47	19-25
	50-62	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25
	62-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	97-100	95-100	35-46	17-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
300:												
Bremer, terrace	0-8	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
	8-19	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
	19-42	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	89-99	47-59	25-33
	42-50	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	40-51	21-29
	50-60	Silty clay loam	CH, CL	A-7	0	0	100	100	91-100	82-97	36-51	17-29
337D2:												
Dickman, loamy substratum, moderately eroded	0-6	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	76-92	46-59	22-33	6-12
	6-19	Fine sandy loam, sandy loam	SC, SC-SM	A-4, A-2	0	0	95-100	90-100	80-97	32-44	20-31	6-12
	19-46	Loamy fine sand	SM	A-2	0	0	95-100	90-100	82-97	21-29	15-23	1-6
	46-56	Fine sandy loam	SC-SM	A-2	0	0	95-100	90-100	80-97	32-44	20-30	6-12
	56-69	Fine sand	SM	A-2	0	0	95-100	91-100	83-97	15-22	15-23	1-6
	69-80	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	98-100	97-100	35-46	17-25
Sharpsburg, moderately eroded	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	93-100	92-99	42-52	18-24
	8-21	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	97-100	96-100	47-56	26-30
	21-40	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	92-100	38-50	19-27
	40-48	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	38-49	19-27
	48-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	35-46	17-25
370:												
Sharpsburg	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	95-100	94-100	43-53	18-24
	8-17	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	97-100	43-51	21-24
	17-31	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	96-100	95-100	47-55	26-31
	31-38	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	90-100	89-99	35-46	17-25
	38-46	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	93-100	92-100	35-46	17-25
	46-60	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	35-47	17-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
370B:												
Sharpsburg------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	95-100	94-100	43-53	18-24
	8-17	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	97-100	43-51	21-24
	17-31	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	96-100	95-100	47-55	26-31
	31-38	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	90-100	89-99	35-46	17-25
	38-46	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	93-100	92-100	35-46	17-25
	46-60	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	35-47	17-25
371C2:												
Sharpsburg, moderately eroded---------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	93-100	92-99	42-52	18-24
	8-21	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	97-100	96-100	47-56	26-30
	21-40	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	92-100	38-50	19-27
	40-48	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	38-49	19-27
	48-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	35-46	17-25
Nira, moderately eroded---------	0-7	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	96-100	44-51	21-24
	7-12	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	12-44	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	39-45	21-24
	44-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
	60-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
371D2:												
Sharpsburg------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	95-100	94-100	43-53	18-24
	8-17	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	97-100	43-51	21-24
	17-31	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	96-100	95-100	47-55	26-31
	31-38	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	90-100	89-99	35-46	17-25
	38-46	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	93-100	92-100	35-46	17-25
	46-60	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	35-47	17-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
371D2:												
Sharpsburg, moderately eroded---------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	93-100	92-99	42-52	18-24
	8-21	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	97-100	96-100	47-56	26-30
	21-40	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	92-100	38-50	19-27
	40-48	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	38-49	19-27
	48-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	35-46	17-25
Nira, moderately eroded---------	0-7	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	96-100	44-51	21-24
	7-12	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	12-44	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	39-45	21-24
	44-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
	60-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
371E2:												
Sharpsburg, moderately eroded---------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	93-100	92-99	42-52	18-24
	8-21	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	97-100	96-100	47-56	26-30
	21-40	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	92-100	38-50	19-27
	40-48	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	95-100	38-49	19-27
	48-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	96-100	94-100	35-46	17-25
Nira, moderately eroded---------	0-7	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	96-100	44-51	21-24
	7-12	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	12-44	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	96-100	39-45	21-24
	44-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
	60-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
430:												
Ackmore, occasionally flooded--------	0-6	Silt loam, silty clay loam	ML, CL	A-6, A-7, A-4	0	0	100	100	95-100	90-100	31-47	10-21
	6-25	Silt loam, silty clay loam	ML, CL	A-6, A-7, A-4	0	0	100	100	94-100	88-100	31-47	10-21
	25-60	Silty clay loam, silt loam	CL, CH	A-7, A-6	0	0	100	100	88-100	84-100	39-60	14-27
431B:												
Judson----------	0-9	Silty clay loam, silt loam	CL, ML	A-7, A-6	0	0	100	100	95-100	91-99	39-50	16-22
	9-22	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	38-49	16-23
	22-28	Silty clay loam	ML, CL	A-7	0	0	100	100	97-100	93-98	43-51	18-22
	28-35	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	41-51	21-25
	35-52	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	93-100	89-96	36-45	17-23
	52-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	35-45	17-23
Ackmore, rarely flooded--------	0-6	Silt loam, silty clay loam	ML, CL	A-6, A-7, A-4	0	0	100	100	95-100	90-100	31-47	10-21
	6-25	Silt loam, silty clay loam	ML, CL	A-6, A-7, A-4	0	0	100	100	94-100	88-100	31-47	10-21
	25-60	Silty clay loam, silt loam	CL, CH	A-7, A-6	0	0	100	100	88-100	84-100	39-60	14-27
Colo, frequently flooded, overwash-------	0-7	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	7-15	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	15-50	Silty clay loam	CL, CH	A-7	0	0	100	100	97-100	93-98	45-53	21-25
	50-70	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	41-49	21-25
	70-80	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	39-47	21-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
435:												
Zook, occasionally flooded--------	0-7	Silty clay loam, silty clay	CH	A-7	0	0	100	100	98-100	93-100	51-68	22-32
	7-20	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	90-100	51-68	22-32
	20-38	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
	38-61	Silty clay loam, silty clay	CH	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	61-80	Silty clay loam, silty clay, silt loam	CL, CH	A-7, A-6	0	0	100	100	87-100	83-100	31-56	13-32
Mt. Sterling, occasionally flooded--------	0-7	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	89-98	29-43	12-18
	7-26	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	94-100	88-100	28-41	12-21
	26-54	Silty clay loam, silty clay	CH	A-7	0	0	100	100	95-100	91-100	45-57	25-33
	54-80	Silty clay, silty clay loam	CL	A-7	0	0	100	100	93-100	89-100	45-60	25-35
469C2:												
Lamoni, moderately eroded---------	0-6	Silty clay loam, clay loam	CL	A-7	0	0	94-100	89-100	82-100	74-97	41-56	19-28
	6-23	Clay, clay loam	CH	A-7	0	0	95-100	89-100	69-100	62-94	42-68	21-40
	23-55	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	55-80	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
469C3:												
Lamoni,												
severely eroded	0-7	Clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	78-100	65-86	40-55	19-28
	7-14	Clay, clay loam	CH	A-7	0	0	95-100	89-100	67-100	58-90	41-66	21-40
	14-48	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	48-60	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
Clarinda,												
severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
	4-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	49-69	29-44
Shelby,												
severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
470D2:												
Lamoni,												
moderately eroded	0-6	Silty clay loam, clay loam	CL	A-7	0	0	94-100	89-100	82-100	74-97	41-56	19-28
	6-23	Clay, clay loam	CH	A-7	0	0	95-100	89-100	69-100	62-94	42-68	21-40
	23-55	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	55-80	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
Shelby,												
moderately eroded	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
509B:												
Marshall,												
terrace	0-7	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	93-100	92-100	41-53	17-25
	7-22	Silty clay loam	CL	A-7-6	0	0	100	100	94-100	92-100	41-52	18-25
	22-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	96-100	95-100	36-48	18-25
	65-71	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-42	17-21
	71-80	Silty clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-41	17-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
509C:												
Marshall, terrace--------	0-7	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	93-100	92-100	41-53	17-25
	7-22	Silty clay loam	CL	A-7-6	0	0	100	100	94-100	92-100	41-52	18-25
	22-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	96-100	95-100	36-48	18-25
	65-71	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-42	17-21
	71-80	Silty clay loam, silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	97-100	96-100	34-41	17-21
509C2:												
Marshall, terrace, moderately eroded---------	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	93-100	39-52	17-25
	6-60	Silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	94-100	35-50	15-25
	60-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	94-100	93-100	35-50	15-25
545B:												
Zook----------	0-7	Silty clay loam, silty clay	CH	A-7	0	0	100	100	98-100	93-100	51-68	22-32
	7-20	Silty clay loam, silty clay	CH	A-7	0	0	100	100	94-100	90-100	51-68	22-32
	20-38	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
	38-61	Silty clay loam, silty clay	CH	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	61-80	Silty clay loam, silty clay, silt loam	CL, CH	A-7, A-6	0	0	100	100	87-100	83-100	31-56	13-32
Ely----------	0-8	Silty clay loam, silt loam	CL	A-7	0	0	100	100	90-100	84-99	39-56	13-24
	8-32	Silty clay loam	CL	A-7	0	0	100	100	94-100	88-96	45-55	18-25
	32-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	88-96	39-51	19-25
	58-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	89-100	83-100	30-47	12-25
Gullied land.												

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
733:												
Calco, occasionally flooded--------	0-8	Silty clay loam	CL	A-7	0	0	100	100	96-100	92-97	48-58	19-23
	8-50	Silty clay loam	CL	A-7	0	0	100	100	96-100	92-97	46-54	19-23
	50-65	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	43-53	21-25
	65-79	Silty clay loam, silt loam	CL	A-6	0	0	100	100	94-100	89-99	34-47	15-23
803:												
Melia, terrace--	0-7	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	90-100	89-100	38-54	13-25
	7-39	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	89-100	35-52	13-25
	39-76	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	89-100	30-48	13-25
	76-80	Silt loam	CL	A-6, A-7-6	0	0	100	100	94-100	92-100	28-42	12-21
824E3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Lamoni, severely eroded	0-7	Clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	78-100	65-86	40-55	19-28
	7-14	Clay, clay loam	CH	A-7	0	0	95-100	89-100	67-100	58-90	41-66	21-40
	14-48	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	48-60	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
870B:												
Sharpsburg, terrace--------	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	95-100	94-100	43-53	18-24
	8-17	Silty clay loam	CL, CH	A-7	0	0	100	100	97-100	95-99	43-50	21-24
	17-38	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	96-100	95-100	48-57	26-30
	38-60	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	95-100	93-100	35-47	17-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
1239:												
Corley, terrace	0-10	Silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	15-25
	10-18	Silt loam			0	0	100	100	100	95-100	37-47	13-19
	18-29	Silt loam			0	0	100	100	100	95-100	33-39	13-17
	29-60	Silty clay loam, silt loam	CL, CH	A-7, A-6	0	0	100	100	100	95-100	35-55	20-30
	60-68	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	15-25
Minden, terrace	0-7	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
	7-22	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
	22-66	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	20-25
	66-80	Silt loam	ML, CL	A-7, A-6	0	0	100	100	100	95-100	35-50	10-25
2428:												
Ely----------	0-8	Silty clay loam, silt loam	CL	A-7	0	0	100	100	90-100	84-99	39-56	13-24
	8-32	Silty clay loam	CL	A-7	0	0	100	100	94-100	88-96	45-55	18-25
	32-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	94-100	88-96	39-51	19-25
	58-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	94-100	88-96	30-47	12-25
Colo, overwash--	0-7	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	7-15	Silt loam	CL	A-6	0	0	100	100	96-100	90-100	37-51	13-21
	15-50	Silty clay loam	CL, CH	A-7	0	0	100	100	97-100	93-98	45-53	21-25
	50-70	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	41-49	21-25
	70-80	Silty clay loam	CL	A-7	0	0	100	100	97-100	93-98	39-47	21-25
Mt. Sterling----	0-7	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	89-98	29-43	12-18
	7-26	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	94-100	88-100	28-41	12-21
	26-54	Silty clay loam, silty clay	CH	A-7	0	0	100	100	95-100	91-100	45-57	25-33
	54-80	Silty clay, silty clay loam	CL	A-7	0	0	100	100	93-100	89-100	45-60	25-35
4946C. Udorthents-Interstate highway												
5030. Pits, limestone quarry												

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
5040. Udorthents, loamy												
5080. Udorthents, sanitary landfill												
AW. Animal waste lagoon												
SL. Sewage lagoon												
W. Water												
Y8B:												
Judson----------	0-9	Silty clay loam, silt loam	CL, ML	A-7, A-6	0	0	100	100	95-100	91-99	39-50	16-22
	9-22	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	38-49	16-23
	22-28	Silty clay loam	ML, CL	A-7	0	0	100	100	97-100	93-98	43-51	18-22
	28-35	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	41-51	21-25
	35-52	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	93-100	89-96	36-45	17-23
	52-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	35-45	17-23
Y8C:												
Judson----------	0-9	Silty clay loam, silt loam	CL, ML	A-7, A-6	0	0	100	100	95-100	91-99	39-50	16-22
	9-22	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	38-49	16-23
	22-28	Silty clay loam	ML, CL	A-7	0	0	100	100	97-100	93-98	43-51	18-22
	28-35	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	41-51	21-25
	35-52	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	93-100	89-96	36-45	17-23
	52-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	35-45	17-23

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Y24C2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Y24D2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Y24D3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Y24E:												
Shelby----------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	71-97	54-77	40-53	16-25
	7-11	Clay loam	CL	A-6, A-7	0	0-4	90-95	79-95	68-91	53-73	38-51	16-25
	11-46	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	70-91	55-73	40-51	21-27
	46-60	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	71-93	55-75	35-47	17-26
	60-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	71-93	55-75	35-47	17-26
Y24E2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Y24E3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Y24F2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Y24F3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Y82C3:												
Adair, severely eroded---------	0-3	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	38-55	16-28
	3-26	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-70	27-44
	26-59	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	59-70	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	70-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Y93D2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Y93D2:												
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Y93D3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Adair, severely eroded---------	0-3	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	38-55	16-28
	3-26	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-70	27-44
	26-59	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	59-70	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	70-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Y93E2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Y192C2:												
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-56	16-28
	7-17	Clay, silty clay, clay loam	CL, CH	A-7	0	0	95-100	76-100	61-100	51-89	49-73	27-45
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	40-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	40-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	40-49	21-27
Y192D2:												
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Y222C2:												
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Y222D2:												
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Y222D3:												
Clarinda, severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
	4-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	49-69	29-44

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Z8B:												
Judson----------	0-9	Silty clay loam, silt loam	CL, ML	A-7, A-6	0	0	100	100	95-100	91-99	39-50	16-22
	9-22	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	38-49	16-23
	22-28	Silty clay loam	ML, CL	A-7	0	0	100	100	97-100	93-98	43-51	18-22
	28-35	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	41-51	21-25
	35-52	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	93-100	89-96	36-45	17-23
	52-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	35-45	17-23
Z8C:												
Judson----------	0-9	Silty clay loam, silt loam	CL, ML	A-7, A-6	0	0	100	100	95-100	91-99	39-50	16-22
	9-22	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	38-49	16-23
	22-28	Silty clay loam	ML, CL	A-7	0	0	100	100	97-100	93-98	43-51	18-22
	28-35	Silty clay loam	CL	A-7	0	0	100	100	97-100	94-99	41-51	21-25
	35-52	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	93-100	89-96	36-45	17-23
	52-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	96-100	92-99	35-45	17-23
Z24D2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Z24D3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Z24E2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Z24E3:												
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Z24F2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Z82D3:												
Adair, severely eroded---------	0-3	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	38-55	16-28
	3-26	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-70	27-44
	26-59	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	59-70	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	70-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Shelby, severely eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-4	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Z93C2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Z93D2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Z93E2:												
Shelby, moderately eroded---------	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-97	54-77	39-52	16-25
	7-37	Clay loam	CL	A-6, A-7	0	0-4	90-95	80-95	71-92	55-73	40-51	21-27
	37-45	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	54-73	35-47	17-26
	45-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	72-94	55-75	35-47	17-26

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Z93E2:												
Adair, moderately eroded---------	0-7	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	17-60	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	60-76	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	76-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Z192C3:												
Adair, severely eroded---------	0-3	Clay loam, silty clay loam	CL	A-7	0	0	100	100	86-100	73-89	38-55	16-28
	3-26	Clay, silty clay, clay loam	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	49-70	27-44
	26-59	Clay loam	CL	A-7, A-6	0	0	95-100	78-100	70-98	59-83	39-49	21-27
	59-70	Clay loam	CL	A-7, A-6	0	0	95-100	79-100	69-96	54-77	39-49	21-27
	70-80	Clay loam	CL	A-7, A-6	0	0	96-100	79-100	70-96	55-77	39-49	21-27
Z222D2:												
Clarinda, moderately eroded---------	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Silty clay, clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44

Physical Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33-kPa or 10-kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. 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.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33-kPa or 10-kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

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

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. 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) and the Revised Universal Soil Loss Equation (RUSLE) 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 and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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 susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Physical Properties of the Soils

(The percentages in the sand and clay columns are shown as low, representative value, and high. The percentages in the silt column are shown as a representative value. Representative values are indicative of conditions that occur most commonly. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
7:														
Wiota, rarely flooded	0-8	1- 8- 14	65	20-27- 32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.5-4.5	.32	.32	5	6	48
	8-28	1- 8- 14	65	20-27- 32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37			
	28-59	1- 8- 14	60	30-33- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	59-80	1- 8- 14	66	25-27- 34	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-1.0	.49	.49			
7B:														
Wiota, rarely flooded	0-8	1- 8- 14	65	20-27- 32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.5-4.5	.32	.32	5	6	48
	8-28	1- 8- 14	65	20-27- 32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37			
	28-59	1- 8- 14	60	30-33- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	59-80	1- 8- 14	66	25-27- 34	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-1.0	.49	.49			
9:														
Marshall----------	0-7	1- 3- 10	66	25-31- 35	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	6	48
	7-22	1- 3- 10	64	27-33- 35	1.20-1.30	1.00-10.00	0.20-0.23	3.0-5.9	2.5-3.5	.28	.28			
	22-65	1- 3- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
	65-71	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.49	.49			
	71-80	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
9B:														
Marshall----------	0-7	1- 3- 10	66	25-31- 35	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	6	48
	7-22	1- 3- 10	64	27-33- 35	1.20-1.30	1.00-10.00	0.20-0.23	3.0-5.9	2.5-3.5	.28	.28			
	22-65	1- 3- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
	65-71	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.49	.49			
	71-80	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
9C2:														
Marshall, moderately eroded----------	0-7	1- 4- 10	65	27-32- 35	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-50	1- 4- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	50-62	1- 4- 10	69	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.49	.49			
	62-80	1- 3- 10	70	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
9C3:														
Marshall, severely eroded----------	0-5	1- 3- 10	68	27-30- 35	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	1.2-2.2	.43	.43	4	6	48
	5-41	1- 3- 10	68	27-29- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
	41-50	1- 3- 10	70	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
	50-80	1- 3- 10	70	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
9D2:														
Marshall, moderately eroded	0-7	1- 4- 10	65	27-32- 35	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-50	1- 4- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	50-62	1- 4- 10	69	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.49	.49			
	62-80	1- 3- 10	70	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
15B:														
Olmitz	0-7	20-40- 50	35	24-26- 27	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	3.0-4.0	.20	.20	5	6	48
	7-30	20-35- 50	37	22-28- 34	1.40-1.50	1.00-10.00	0.15-0.17	3.0-5.9	2.0-3.0	.28	.28			
	30-60	20-35- 50	35	27-31- 34	1.45-1.55	1.00-10.00	0.14-0.16	3.0-5.9	1.0-2.0	.28	.28			
Ely	0-8	5-10- 20	62	20-28- 35	1.30-1.60	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	5	6	48
	8-32	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.24	.24			
	32-58	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	58-80	5-10- 20	63	18-27- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
Zook	0-7	1- 8- 14	59	32-34- 45	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	5	6	48
	7-20	1- 8- 14	57	32-36- 45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32			
	20-38	1- 8- 14	52	32-41- 45	1.30-1.45	0.01-0.10	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
	38-61	1- 8- 14	55	36-38- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32			
	61-80	1- 8- 14	60	20-33- 45	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
16:														
Nodaway, occasionally flooded	0-7	1- 8- 14	67	18-26- 35	1.40-1.50	1.00-10.00	0.22-0.24	3.0-5.9	1.5-2.5	.37	.37	5	6	48
	7-80	1- 7- 14	67	18-26- 35	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
Kennebec, occasionally flooded	0-8	1- 6- 10	70	18-25- 27	1.45-1.60	1.00-10.00	0.22-0.24	3.0-5.9	4.0-6.0	.28	.28	5	6	48
	8-54	1- 6- 10	70	18-25- 27	1.45-1.60	1.00-10.00	0.20-0.22	3.0-5.9	2.0-4.0	.37	.37			
	54-80	1- 8- 15	66	24-26- 27	1.45-1.60	1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
43:														
Bremer, rarely flooded	0-8	1- 8- 14	61	27-32- 36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.37	.37	5	6	48
	8-19	1- 8- 14	61	27-32- 36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.37	.37			
	19-42	1- 8- 14	53	35-40- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37			
	42-50	1- 8- 14	58	30-35- 40	1.30-1.40	0.10-1.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	50-60	10-15- 40	52	25-34- 40	1.40-1.50	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
54:														
Zook, occasionally flooded	0-7	1- 8- 14	59	32-34- 45	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	5	6	48
	7-20	1- 8- 14	57	32-36- 45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32			
	20-38	1- 8- 14	52	32-41- 45	1.30-1.45	0.01-0.10	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
	38-61	1- 8- 14	55	36-38- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32			
	61-80	1- 8- 14	60	20-33- 45	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
54+:														
Zook, occasionally flooded, overwash	0-7	5-13- 20	65	20-23- 26	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.0-4.0	.43	.43	5	6	48
	7-13	5-13- 20	65	20-23- 26	1.45-1.50	1.00-10.00	0.22-0.24	3.0-5.9	2.0-4.0	.43	.43			
	13-50	1- 8- 14	55	32-38- 45	1.30-1.45	0.10-1.00	0.21-0.23	6.0-8.9	3.0-5.0	.32	.32			
	50-58	1- 8- 14	55	36-38- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32			
	58-80	1- 8- 14	60	20-33- 45	1.30-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
88:														
Nevin, rarely flooded	0-8	5- 7- 15	65	26-28- 29	1.30-1.40	1.00-10.00	0.22-0.24	0.0-2.9	4.0-6.0	.28	.28	5	6	48
	8-24	5- 7- 15	66	26-28- 29	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	4.0-6.0	.28	.28			
	24-46	5- 8- 15	59	30-33- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37			
	46-62	5- 9- 15	62	25-29- 36	1.40-1.50	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
99D2:														
Exira, moderately eroded	0-6	1- 2- 10	68	28-30- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	6-33	1- 2- 10	71	25-27- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
	33-37	1- 2- 10	73	25-25- 35	1.25-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
	37-80	1- 3- 10	72	20-25- 30	1.30-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
99D3:														
Exira, severely eroded	0-5	1- 3- 10	66	28-31- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	1.2-2.2	.43	.43	4	6	48
	5-36	1- 3- 10	70	25-27- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.49	.49			
	36-44	1- 3- 10	71	25-26- 35	1.25-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
	44-80	1- 3- 10	73	20-24- 30	1.30-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
99E2:														
Exira, moderately eroded	0-6	1- 2- 10	68	28-30- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	6-33	1- 2- 10	71	25-27- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
	33-37	1- 2- 10	73	25-25- 35	1.25-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
	37-80	1- 3- 10	72	20-25- 30	1.30-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
99E3:														
Exira, severely eroded	0-5	1- 3- 10	66	28-31- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	1.2-2.2	.43	.43	4	6	48
	5-36	1- 3- 10	70	25-27- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.49	.49			
	36-44	1- 3- 10	71	25-26- 35	1.25-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
	44-80	1- 3- 10	73	20-24- 30	1.30-1.35	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
113B:														
Colo, frequently flooded, overwash	0-7	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32	5	6	48
	7-15	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32			
	15-50	1- 7- 15	61	30-33- 35	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
	50-70	1- 7- 15	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	70-80	5- 7- 30	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
Ely	0-8	5-10- 20	62	20-28- 35	1.30-1.60	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	5	6	48
	8-32	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.24	.24			
	32-58	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	58-80	5-10- 20	63	18-27- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
136:														
Ankeny, occasionally flooded	0-7	55-65- 75	21	10-14- 18	1.50-1.70	10.00-40.00	0.16-0.18	0.0-2.9	2.5-3.5	.17	.17	4	3	86
	7-30	55-65- 75	21	10-14- 18	1.50-1.70	10.00-40.00	0.16-0.18	0.0-2.9	2.5-3.5	.17	.17			
	30-44	60-70- 80	17	10-13- 16	1.50-1.70	10.00-40.00	0.15-0.17	0.0-2.9	0.5-1.0	.24	.24			
	44-60	75-85- 95	10	2- 5- 8	1.55-1.70	40.00-100.00	0.08-0.10	0.0-2.9	0.0-0.5	.15	.15			
212:														
Kennebec, occasionally flooded	0-8	1- 6- 10	70	18-25- 27	1.45-1.60	1.00-10.00	0.22-0.24	3.0-5.9	4.0-6.0	.28	.28	5	6	48
	8-54	1- 6- 10	70	18-25- 27	1.45-1.60	1.00-10.00	0.20-0.22	3.0-5.9	2.0-4.0	.37	.37			
	54-80	1- 8- 15	66	24-26- 27	1.45-1.60	1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
220:														
Nodaway, occasionally flooded	0-7	1- 8- 14	67	18-26- 35	1.40-1.50	1.00-10.00	0.22-0.24	3.0-5.9	1.5-2.5	.37	.37	5	6	48
	7-80	1- 7- 14	67	18-26- 35	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
229C2:														
Clarinda, moderately eroded	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
229C2:														
Clarinda, severely eroded	0-4	1- 8- 14	45	40-48- 55	1.30-1.40	0.01-0.10	0.12-0.14	6.0-8.9	1.7-2.7	.28	.28	2	4	86
	4-80	1- 8- 14	43	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
229D2:														
Clarinda, moderately eroded	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Clarinda, severely eroded	0-4	1- 8- 14	45	40-48- 55	1.30-1.40	0.01-0.10	0.12-0.14	6.0-8.9	1.7-2.7	.28	.28	2	4	86
	4-80	1- 8- 14	43	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
247D2:														
Shelby, sandy substratum, moderately eroded	0-5	20-33- 45	45	20-23- 26	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	5-33	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	33-51	20-33- 45	45	20-23- 26	1.55-1.65	1.00-10.00	0.17-0.19	3.0-5.9	0.0-0.5	.43	.43			
	51-80	52-65- 75	22	8-13- 18	1.60-1.70	10.00-100.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.28			
Hesch, deep, moderately eroded	0-7	20-33- 45	45	20-23- 26	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-18	33-45- 63	37	10-18- 26	1.50-1.55	1.00-10.00	0.17-0.19	0.0-2.9	1.0-1.0	.37	.37			
	18-39	52-67- 78	19	10-14- 18	1.50-1.70	10.00-100.00	0.15-0.17	0.0-2.9	0.0-0.5	.28	.28			
	39-49	68-81- 92	14	2- 5- 8	1.55-1.70	10.00-100.00	0.08-0.10	0.0-2.9	0.0-0.5	.32	.32			
	49-80	--	--	1- 2- 2	---	---	---	---	---	---	---			
Hesch, moderately eroded	0-9	33-40- 45	40	10-20- 27	1.45-1.70	1.00-10.00	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	6	48
	9-17	20-33- 45	38	27-30- 35	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	17-28	75-84- 90	14	1- 3- 5	1.55-1.70	10.00-100.00	0.08-0.10	0.0-2.9	0.0-0.5	.24	.24			
	28-80	--	--	--	---	---	---	---	---	---	---			
269:														
Humeston, occasionally flooded, occasionally ponded	0-11	5-15- 20	58	24-27- 30	1.35-1.45	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	8	0
	11-25	5-15- 20	62	20-23- 26	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-2.0	.49	.49			
	25-31	5-13- 20	55	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
	31-72	5- 8- 10	54	35-39- 48	1.30-1.50	0.10-1.00	0.13-0.18	6.0-8.9	1.0-1.5	.37	.37			
	72-80	5-10- 20	56	30-34- 38	1.40-1.50	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
273B:														
Olmitz	0-7	20-40- 50	35	24-26- 27	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	3.0-4.0	.20	.20	5	6	48
	7-30	20-35- 50	37	22-28- 34	1.40-1.50	1.00-10.00	0.15-0.17	3.0-5.9	2.0-3.0	.32	.32			
	30-60	20-35- 50	35	27-31- 34	1.45-1.55	1.00-10.00	0.14-0.16	3.0-5.9	1.0-2.0	.32	.32			
289D2:														
Dickman, loamy substratum, moderately eroded	0-6	60-70- 80	16	10-14- 18	1.50-1.60	10.00-100.00	0.16-0.18	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-19	60-70- 80	16	10-14- 18	1.50-1.60	10.00-100.00	0.15-0.17	0.0-2.9	0.0-1.0	.24	.24			
	19-46	80-88- 95	6	4- 7- 10	1.55-1.65	10.00-100.00	0.09-0.11	0.0-2.9	0.0-0.5	.24	.24			
	46-56	60-70- 80	16	10-14- 18	1.55-1.65	10.00-100.00	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	56-69	80-90- 95	3	4- 7- 10	1.60-1.70	100-705	0.05-0.07	0.0-2.9	0.0-0.5	.20	.20			
	69-80	1- 3- 5	71	25-26- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
Marshall, moderately eroded	0-7	1- 4- 10	65	27-32- 35	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-50	1- 4- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	50-62	1- 4- 10	69	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.49	.49			
	62-80	1- 3- 10	70	25-28- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
300:														
Bremer, terrace	0-8	1- 8- 14	61	27-32- 36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.37	.37	5	6	48
	8-19	1- 8- 14	61	27-32- 36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.37	.37			
	19-42	1- 8- 14	53	35-40- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37			
	42-50	1- 8- 14	58	30-35- 40	1.30-1.40	0.10-1.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	50-60	10-15- 40	52	25-34- 40	1.40-1.50	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
337D2:														
Dickman, loamy substratum, moderately eroded	0-6	40-53- 65	34	10-14- 18	1.50-1.60	10.00-100.00	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	3	86
	6-19	60-70- 80	16	10-14- 18	1.50-1.60	10.00-100.00	0.15-0.17	0.0-2.9	0.0-1.0	.24	.24			
	19-46	80-88- 95	6	4- 7- 10	1.55-1.65	10.00-100.00	0.09-0.11	0.0-2.9	0.0-0.5	.24	.24			
	46-56	60-70- 80	16	10-14- 18	1.55-1.65	10.00-100.00	0.14-0.16	0.0-2.9	0.0-0.5	.24	.24			
	56-69	80-90- 95	3	4- 7- 10	1.60-1.70	100-705	0.05-0.07	0.0-2.9	0.0-0.5	.20	.20			
	69-80	1- 3- 5	71	25-26- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
Sharpsburg, moderately eroded	0-8	1- 3- 5	64	27-34- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.37	.37	5	6	48
	8-21	1- 3- 5	59	36-38- 42	1.30-1.50	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.5	.37	.37			
	21-40	1- 3- 5	63	28-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.43	.43			
	40-48	1- 3- 5	66	28-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.43	.43			
	48-80	1- 3- 5	68	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
370:														
Sharpsburg----------	0-8	1- 3- 5	66	27-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	5	6	48
	8-17	1- 2- 5	67	30-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.5	.37	.37			
	17-31	1- 2- 5	59	36-40- 42	1.30-1.40	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37			
	31-38	1- 2- 5	64	25-35- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.43	.43			
	38-46	1- 2- 5	67	25-32- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.49	.49			
	46-60	1- 2- 5	69	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
370B:														
Sharpsburg----------	0-8	1- 3- 5	66	27-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	5	6	48
	8-17	1- 2- 5	67	30-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.5	.37	.37			
	17-31	1- 2- 5	59	36-40- 42	1.30-1.40	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37			
	31-38	1- 2- 5	64	25-35- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.43	.43			
	38-46	1- 2- 5	67	25-32- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.49	.49			
	46-60	1- 2- 5	69	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
371C2:														
Sharpsburg, moderately eroded---	0-8	1- 3- 5	64	27-34- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.37	.37	5	6	48
	8-21	1- 3- 5	59	36-38- 42	1.30-1.50	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.5	.37	.37			
	21-40	1- 3- 5	63	28-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.43	.43			
	40-48	1- 3- 5	66	28-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.43	.43			
	48-80	1- 3- 5	68	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
Nira, moderately eroded----------	0-7	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-12	1- 3- 5	63	33-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	12-44	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	44-60	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
	60-80	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
371D2:														
Sharpsburg----------	0-8	1- 3- 5	66	27-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	5	6	48
	8-17	1- 2- 5	67	30-32- 34	1.25-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.5	.37	.37			
	17-31	1- 2- 5	59	36-40- 42	1.30-1.40	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37			
	31-38	1- 2- 5	64	25-35- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.43	.43			
	38-46	1- 2- 5	67	25-32- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.2-0.5	.49	.49			
	46-60	1- 2- 5	69	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
Sharpsburg, moderately eroded---	0-8	1- 3- 5	64	27-34- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.37	.37	5	6	48
	8-21	1- 3- 5	59	36-38- 42	1.30-1.50	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.5	.37	.37			
	21-40	1- 3- 5	63	28-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.43	.43			
	40-48	1- 3- 5	66	28-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.43	.43			
	48-80	1- 3- 5	68	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
371D2:														
Nira, moderately eroded	0-7	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-12	1- 3- 5	63	33-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	12-44	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	44-60	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
	60-80	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
371E2:														
Sharpsburg, moderately eroded	0-8	1- 3- 5	64	27-34- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.37	.37	5	6	48
	8-21	1- 3- 5	59	36-38- 42	1.30-1.50	0.10-1.00	0.18-0.20	6.0-8.9	0.5-1.5	.37	.37			
	21-40	1- 3- 5	63	28-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.43	.43			
	40-48	1- 3- 5	66	28-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.3-0.5	.43	.43			
	48-80	1- 3- 5	68	25-29- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
Nira, moderately eroded	0-7	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	7-12	1- 3- 5	63	33-34- 38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	12-44	1- 3- 5	65	30-32- 34	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	44-60	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
	60-80	1- 3- 5	69	25-28- 30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
430:														
Ackmore, occasionally flooded	0-6	1-10- 15	68	18-23- 30	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	6-25	1- 9- 15	67	18-24- 30	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43			
	25-60	1- 7- 15	61	20-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	6.0-8.9	3.0-5.0	.32	.32			
431B:														
Judson	0-9	1- 6- 10	65	24-29- 32	1.35-1.40	1.00-10.00	0.21-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
	9-22	1- 4- 10	67	24-29- 32	1.30-1.35	1.00-10.00	0.21-0.24	3.0-5.9	2.0-3.0	.43	.43			
	22-28	1- 4- 10	65	27-31- 32	1.25-1.30	1.00-10.00	0.18-0.22	3.0-5.9	2.0-3.0	.43	.43			
	28-35	1- 4- 10	63	30-33- 35	1.30-1.35	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	35-52	1- 6- 10	63	25-31- 32	1.35-1.40	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	52-60	1- 3- 10	68	25-29- 32	1.40-1.45	1.00-10.00	0.21-0.23	3.0-5.9	0.0-1.0	.49	.49			
Ackmore, rarely flooded	0-6	1-10- 15	68	18-23- 30	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	6-25	1- 9- 15	67	18-24- 30	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43			
	25-60	1- 7- 15	61	20-32- 38	1.30-1.40	1.00-10.00	0.18-0.20	6.0-8.9	3.0-5.0	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
431B:														
Colo, frequently flooded, overwash---	0-7	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32	5	6	48
	7-15	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32			
	15-50	1- 7- 15	61	30-33- 35	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
	50-70	1- 7- 15	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	70-80	5- 7- 30	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
435:														
Zook, occasionally flooded----------	0-7	1- 8- 14	59	32-34- 45	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	5	6	48
	7-20	1- 8- 14	57	32-36- 45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32			
	20-38	1- 8- 14	52	32-41- 45	1.30-1.45	0.01-0.10	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
	38-61	1- 8- 14	55	36-38- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32			
	61-80	1- 8- 14	60	20-33- 45	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
Mt. Sterling, occasionally flooded	0-7	5-10- 15	68	18-23- 27	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	7-26	5-10- 15	66	18-24- 30	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.5-1.0	.55	.55			
	26-54	3- 7- 10	54	35-40- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	0.0-1.0	.37	.37			
	54-80	3- 7- 10	52	35-42- 48	1.30-1.35	0.01-0.10	0.10-0.12	6.0-8.9	0.0-1.0	.37	.37			
469C2:														
Lamoni, moderately eroded----------	0-6	10-17- 30	50	27-34- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-23	10-15- 30	38	30-48- 55	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-2.0	.28	.28			
	23-55	20-30- 40	36	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	55-80	20-30- 40	36	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Clarinda, moderately eroded----------	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
469C3:														
Lamoni, severely eroded----------	0-7	10-33- 35	34	27-34- 40	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.32	.32	2	6	48
	7-14	10-20- 30	33	30-48- 55	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.3-1.0	.28	.28			
	14-48	20-30- 40	36	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	48-60	20-30- 40	36	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
469C3:														
Clarinda, severely eroded	0-4	1- 8- 14	45	40-48- 55	1.30-1.40	0.01-0.10	0.12-0.14	6.0-8.9	1.7-2.7	.28	.28	2	4	86
	4-80	1- 8- 14	43	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Shelby, severely eroded	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
470D2:														
Lamoni, moderately eroded	0-6	10-15- 30	52	27-34- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-23	10-15- 30	38	30-48- 55	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-2.0	.28	.28			
	23-55	20-30- 40	36	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	55-80	20-30- 40	36	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
509B:														
Marshall, terrace	0-7	1- 3- 10	66	25-31- 35	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	6	48
	7-22	1- 3- 10	64	27-33- 35	1.20-1.30	1.00-10.00	0.20-0.23	3.0-5.9	2.5-3.5	.28	.28			
	22-65	1- 3- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
	65-71	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.49	.49			
	71-80	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
509C:														
Marshall, terrace	0-7	1- 3- 10	66	25-31- 35	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	6	48
	7-22	1- 3- 10	64	27-33- 35	1.20-1.30	1.00-10.00	0.20-0.23	3.0-5.9	2.5-3.5	.28	.28			
	22-65	1- 3- 10	67	27-30- 35	1.25-1.30	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
	65-71	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.3-1.0	.49	.49			
	71-80	1- 3- 10	70	25-27- 30	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
509C2:														
Marshall, terrace, moderately eroded	0-6	1- 3- 10	67	25-30- 35	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	5	6	48
	6-60	1- 3- 10	66	27-31- 35	1.30-1.35	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37			
	60-80	1- 3- 10	67	25-30- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
545B:														
Zook	0-7	1- 8- 14	59	32-34- 45	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	5	6	48
	7-20	1- 8- 14	57	32-36- 45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32			
	20-38	1- 8- 14	52	32-41- 45	1.30-1.45	0.01-0.10	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
	38-61	1- 8- 14	55	36-38- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32			
	61-80	1- 8- 14	60	20-33- 45	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
Ely	0-8	5-10- 20	62	20-28- 35	1.30-1.60	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	5	6	48
	8-32	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.24	.24			
	32-58	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	58-80	5-10- 20	63	18-27- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
Gullied land.														
733:														
Calco, occasionally flooded	0-8	1- 7- 15	63	24-31- 35	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	5	4L	86
	8-50	1- 7- 15	63	24-31- 35	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.32	.32			
	50-65	1- 6- 15	61	24-33- 35	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37			
	65-79	1- 7- 35	66	24-27- 35	1.30-1.45	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
803:														
Melia, terrace	0-7	1- 3- 10	68	20-29- 35	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	3.5-4.5	.28	.28	5	6	48
	7-39	1- 3- 10	68	20-29- 35	1.25-1.30	1.00-10.00	0.20-0.23	1.0-5.9	2.5-3.5	.32	.32			
	39-76	1- 3- 10	68	20-29- 35	1.30-1.35	1.00-10.00	0.18-0.20	1.0-5.9	0.5-1.5	.49	.49			
	76-80	1- 3- 10	73	18-24- 30	1.35-1.40	1.00-10.00	0.18-0.20	1.0-4.5	0.3-1.0	.49	.49			
824E3:														
Shelby, severely eroded	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Lamoni, severely eroded	0-7	10-33- 35	34	27-34- 40	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.32	.32	2	6	48
	7-14	10-20- 30	33	30-48- 55	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.3-1.0	.28	.28			
	14-48	20-30- 40	36	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	48-60	20-30- 40	36	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
870B:														
Sharpsburg, terrace	0-8	1- 3- 5	66	27-32- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	5	6	48
	8-17	1- 3- 5	64	30-33- 34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.0	.37	.37			
	17-38	1- 3- 5	58	36-39- 42	1.35-1.40	0.10-1.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37			
	38-60	1- 3- 5	67	25-30- 35	1.40-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
1239:														
Corley, terrace------	0-10	1- 3- 5	74	20-24- 27	1.20-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.5-4.5	.32	.32	5	8	0
	10-18	1- 3- 5	74	20-24- 27	1.25-1.35	1.00-10.00	0.22-0.24	3.0-5.9	3.0-4.0	.32	.32			
	18-29	1- 3- 5	75	20-22- 24	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	1.0-1.5	.49	.49			
	29-60	1- 3- 5	68	26-29- 32	1.30-1.55	1.00-10.00	0.18-0.20	6.0-8.9	0.0-1.0	.49	.49			
	60-68	1- 3- 5	71	24-26- 28	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.49	.49			
Minden, terrace------	0-7	1- 4- 10	67	27-30- 32	1.25-1.30	1.00-10.00	0.21-0.23	3.0-5.9	5.0-6.0	.37	.37	5	6	48
	7-22	1- 4- 10	64	27-32- 35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	3.0-5.0	.32	.32			
	22-66	1- 4- 10	64	29-32- 35	1.40-1.45	1.00-10.00	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
	66-80	1- 4- 10	72	22-25- 27	1.40-1.45	1.00-10.00	0.20-0.22	3.0-5.9	0.5-1.0	.49	.49			
2428:														
Ely----------	0-8	5-10- 20	62	20-28- 35	1.30-1.60	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	5	6	48
	8-32	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.24	.24			
	32-58	5-10- 20	59	27-31- 35	1.30-1.55	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	58-80	5-10- 20	63	18-27- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
Colo, overwash-------	0-7	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32	5	6	48
	7-15	2-10- 25	67	20-24- 30	1.25-1.30	1.00-10.00	0.22-0.24	3.0-5.9	3.0-5.0	.32	.32			
	15-50	1- 7- 15	61	30-33- 35	1.25-1.35	1.00-10.00	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
	50-70	1- 7- 15	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	70-80	5- 7- 30	61	30-33- 35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
Mt. Sterling---------	0-7	5-10- 15	68	18-23- 27	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	7-26	5-10- 15	66	18-24- 30	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.5-1.0	.55	.55			
	26-54	3- 7- 10	54	35-40- 45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	0.0-1.0	.37	.37			
	54-80	3- 7- 10	52	35-42- 48	1.30-1.35	0.01-0.10	0.10-0.12	6.0-8.9	0.0-1.0	.37	.37			
4946C. Udorthents-Interstate highway														
5030. Pits, limestone quarry														
5040. Udorthents, loamy														
5080. Udorthents, sanitary landfill														
AW. Animal waste lagoon														

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
SL.														
Sewage lagoon														
W.														
Water														
Y8B:														
Judson----------	0-9	1- 6- 10	65	24-29- 32	1.35-1.40	1.00-10.00	0.21-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
	9-22	1- 4- 10	67	24-29- 32	1.30-1.35	1.00-10.00	0.21-0.24	3.0-5.9	2.0-3.0	.43	.43			
	22-28	1- 4- 10	65	27-31- 32	1.25-1.30	1.00-10.00	0.18-0.22	3.0-5.9	2.0-3.0	.43	.43			
	28-35	1- 4- 10	63	30-33- 35	1.30-1.35	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	35-52	1- 6- 10	63	25-31- 32	1.35-1.40	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	52-60	1- 3- 10	68	25-29- 32	1.40-1.45	1.00-10.00	0.21-0.23	3.0-5.9	0.0-1.0	.49	.49			
Y8C:														
Judson----------	0-9	1- 6- 10	65	24-29- 32	1.35-1.40	1.00-10.00	0.21-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
	9-22	1- 4- 10	67	24-29- 32	1.30-1.35	1.00-10.00	0.21-0.24	3.0-5.9	2.0-3.0	.43	.43			
	22-28	1- 4- 10	65	27-31- 32	1.25-1.30	1.00-10.00	0.18-0.22	3.0-5.9	2.0-3.0	.43	.43			
	28-35	1- 4- 10	63	30-33- 35	1.30-1.35	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	35-52	1- 6- 10	63	25-31- 32	1.35-1.40	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	52-60	1- 3- 10	68	25-29- 32	1.40-1.45	1.00-10.00	0.21-0.23	3.0-5.9	0.0-1.0	.49	.49			
Y24C2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Y24D2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Y24D3:														
Shelby, severely eroded----------	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Y24E:														
Shelby----------	0-7	20-35- 45	37	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	3.0-4.0	.24	.24	5	6	48
	7-11	20-34- 45	37	24-30- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28			
	11-46	20-34- 45	33	30-34- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	46-60	20-34- 45	37	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	60-80	30-34- 50	37	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Y24E2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Y24E3:														
Shelby, severely eroded----------	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Y24F2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Y24F3:														
Shelby, severely eroded----------	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Y82C3:														
Adair, severely eroded----------	0-3	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.37	.37	2	6	48
	3-26	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-1.0	.24	.24			
	26-59	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	59-70	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	70-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.7	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Y82C3:														
Shelby, severely eroded----------	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Y93D2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Adair, moderately eroded----------	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Y93D3:														
Shelby, severely eroded----------	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Adair, severely eroded----------	0-3	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.37	.37	2	6	48
	3-26	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-1.0	.24	.24			
	26-59	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	59-70	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	70-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.7	0.0-0.5	.32	.32			
Y93E2:														
Shelby, moderately eroded----------	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Y93E2:														
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Y192C2:														
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	0.10-1.00	0.17-0.19	3.2-5.8	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.10-0.40	0.09-0.11	6.7-13.7	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	0.10-1.00	0.15-0.17	4.2-6.7	0.0-0.5	.37	.37			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	0.10-1.00	0.14-0.16	4.2-6.7	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	0.10-1.00	0.14-0.16	4.2-6.7	0.0-0.5	.32	.32			
Y192D2:														
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Y222C2:														
Clarinda, moderately eroded	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Y222D2:														
Clarinda, moderately eroded	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Y222D3:														
Clarinda, severely eroded	0-4	1- 8- 14	45	40-48- 55	1.30-1.40	0.01-0.10	0.12-0.14	6.0-8.9	1.7-2.7	.28	.28	2	4	86
	4-80	1- 8- 14	43	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			
Z8B:														
Judson	0-9	1- 6- 10	65	24-29- 32	1.35-1.40	1.00-10.00	0.21-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
	9-22	1- 4- 10	67	24-29- 32	1.30-1.35	1.00-10.00	0.21-0.24	3.0-5.9	2.0-3.0	.43	.43			
	22-28	1- 4- 10	65	27-31- 32	1.25-1.30	1.00-10.00	0.18-0.22	3.0-5.9	2.0-3.0	.43	.43			
	28-35	1- 4- 10	63	30-33- 35	1.30-1.35	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	35-52	1- 6- 10	63	25-31- 32	1.35-1.40	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	52-60	1- 3- 10	68	25-29- 32	1.40-1.45	1.00-10.00	0.21-0.23	3.0-5.9	0.0-1.0	.49	.49			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Z8C:														
Judson	0-9	1- 6- 10	65	24-29- 32	1.35-1.40	1.00-10.00	0.21-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
	9-22	1- 4- 10	67	24-29- 32	1.30-1.35	1.00-10.00	0.21-0.24	3.0-5.9	2.0-3.0	.43	.43			
	22-28	1- 4- 10	65	27-31- 32	1.25-1.30	1.00-10.00	0.18-0.22	3.0-5.9	2.0-3.0	.43	.43			
	28-35	1- 4- 10	63	30-33- 35	1.30-1.35	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	35-52	1- 6- 10	63	25-31- 32	1.35-1.40	1.00-10.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	52-60	1- 3- 10	68	25-29- 32	1.40-1.45	1.00-10.00	0.21-0.23	3.0-5.9	0.0-1.0	.49	.49			
Z24D2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Z24D3:														
Shelby, severely eroded	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Z24E2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Z24E3:														
Shelby, severely eroded	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Z24F2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Z82D3:														
Adair, severely eroded	0-3	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.37	.37	2	6	48
	3-26	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-1.0	.24	.24			
	26-59	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	59-70	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	70-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.7	0.0-0.5	.32	.32			
Shelby, severely eroded	0-2	20-33- 45	37	24-31- 35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	4	6	48
	2-48	20-33- 45	34	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.32	.32			
	48-62	30-33- 60	37	25-31- 36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
	62-80	30-33- 60	37	25-31- 36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.32	.32			
Z93C2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Z93D2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	um/sec	In/in	Pct	Pct					
Z93E2:														
Shelby, moderately eroded	0-7	20-35- 45	36	24-29- 35	1.40-1.50	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.28	.28	5	6	48
	7-37	20-35- 45	33	30-32- 38	1.45-1.55	1.00-10.00	0.15-0.17	3.0-5.9	0.5-1.5	.28	.28			
	37-45	20-35- 45	35	25-30- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	45-80	30-35- 60	37	25-28- 36	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Adair, moderately eroded	0-7	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.0	2.2-3.2	.37	.37	3	6	48
	7-17	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-11.2	0.5-1.0	.24	.24			
	17-60	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	60-76	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	76-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
Z192C3:														
Adair, severely eroded	0-3	15-23- 30	46	24-32- 40	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	1.7-2.7	.37	.37	2	6	48
	3-26	15-25- 35	26	38-49- 60	1.25-1.40	0.01-0.10	0.09-0.11	6.0-8.9	0.5-1.0	.24	.24			
	26-59	15-25- 35	41	30-34- 38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.32			
	59-70	20-33- 45	34	30-34- 38	1.55-1.65	1.00-10.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	70-80	20-33- 45	34	30-34- 38	1.60-1.70	1.00-10.00	0.14-0.16	3.0-5.7	0.0-0.5	.32	.32			
Z222D2:														
Clarinda, moderately eroded	0-6	1- 5- 14	63	25-33- 40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	6	48
	6-80	1- 8- 14	42	40-50- 60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.32	.32			

Chemical Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil 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.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
7:				
Wiota, rarely flooded	0-8	17-27	5.1-7.3	0
	8-28	17-27	5.1-7.3	0
	28-59	24-28	5.1-6.5	0
	59-80	17-27	5.6-6.5	0
7B:				
Wiota, rarely flooded	0-8	17-27	5.1-7.3	0
	8-28	17-27	5.1-7.3	0
	28-59	24-28	5.1-6.5	0
	59-80	17-27	5.6-6.5	0
9:				
Marshall	0-7	21-29	5.6-7.3	0
	7-22	23-29	5.6-7.3	0
	22-65	21-28	5.6-6.5	0
	65-71	19-24	5.6-7.3	0
	71-80	17-23	6.1-7.3	0
9B:				
Marshall	0-7	21-29	5.6-7.3	0
	7-22	23-29	5.6-7.3	0
	22-65	21-28	5.6-6.5	0
	65-71	19-24	5.6-7.3	0
	71-80	17-23	6.1-7.3	0
9C2:				
Marshall, moderately eroded	0-7	22-29	5.6-7.3	0
	7-50	21-28	5.6-6.5	0
	50-62	19-27	6.1-7.3	0
	62-80	17-27	6.1-7.3	0
9C3:				
Marshall, severely eroded	0-5	22-28	5.6-7.3	0
	5-41	21-28	5.6-7.3	0
	41-50	17-27	5.6-7.3	0
	50-80	17-28	5.6-7.3	0
9D2:				
Marshall, moderately eroded	0-7	22-29	5.6-7.3	0
	7-50	21-28	5.6-6.5	0
	50-62	19-27	6.1-7.3	0
	62-80	17-27	6.1-7.3	0
15B:				
Olmitz	0-7	20-23	5.6-7.3	0
	7-30	19-28	5.1-7.3	0
	30-60	22-28	5.1-7.3	0
Ely	0-8	18-30	5.6-7.3	0
	8-32	23-29	5.6-7.3	0
	32-58	22-29	5.6-7.3	0
	58-80	15-28	5.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
15B:				
Zook	0-7	26-36	5.6-7.8	0-10
	7-20	26-36	5.6-7.8	0-10
	20-38	26-35	5.6-7.8	0-10
	38-61	28-35	6.1-7.3	0
	61-80	15-33	6.1-7.3	0
16:				
Nodaway, occasionally flooded	0-7	15-29	6.1-7.3	0
	7-80	13-27	6.1-7.3	0
Kennebec, occasionally flooded	0-8	16-23	5.6-7.3	0
	8-54	16-23	6.1-7.3	0
	54-80	20-22	6.1-7.3	0
43:				
Bremer, rarely flooded	0-8	23-29	5.6-7.3	0
	8-19	23-29	5.6-7.3	0
	19-42	27-34	5.6-7.3	0
	42-50	23-30	5.6-7.3	0
	50-60	20-30	5.6-7.8	0-10
54:				
Zook, occasionally flooded	0-7	26-36	5.6-7.8	0-10
	7-20	26-36	5.6-7.8	0-10
	20-38	26-35	5.6-7.8	0-10
	38-61	28-35	6.1-7.3	0
	61-80	15-33	6.1-7.3	0
54+:				
Zook, occasionally flooded, overwash	0-7	17-22	5.6-7.8	0-10
	7-13	17-22	5.6-7.8	0-10
	13-50	26-35	5.6-7.8	0-10
	50-58	28-35	6.1-7.3	0
	58-80	15-33	6.1-7.3	0
88:				
Nevin, rarely flooded	0-8	22-25	5.6-7.3	0
	8-24	22-25	5.6-7.3	0
	24-46	24-28	5.6-7.3	0
	46-62	17-27	6.1-7.3	0
99D2:				
Exira, moderately eroded	0-6	23-28	5.6-7.3	0
	6-33	20-28	5.6-7.3	0
	33-37	17-27	5.6-7.3	0
	37-80	14-23	6.1-7.3	0
99D3:				
Exira, severely eroded	0-5	23-28	5.6-7.3	0
	5-36	19-27	5.6-7.3	0
	36-44	17-27	5.6-7.3	0
	44-80	14-23	6.1-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
99E2:				
Exira, moderately eroded	0-6	23-28	5.6-7.3	0
	6-33	20-28	5.6-7.3	0
	33-37	17-27	5.6-7.3	0
	37-80	14-23	6.1-7.3	0
99E3:				
Exira, severely eroded	0-5	23-28	5.6-7.3	0
	5-36	19-27	5.6-7.3	0
	36-44	17-27	5.6-7.3	0
	44-80	14-23	6.1-7.3	0
113B:				
Colo, frequently flooded, overwash	0-7	17-26	6.1-7.8	0-10
	7-15	17-26	6.1-7.3	0
	15-50	25-29	5.6-7.3	0
	50-70	24-28	5.6-7.3	0
	70-80	20-28	5.6-7.3	0
Ely	0-8	18-30	5.6-7.3	0
	8-32	23-29	5.6-7.3	0
	32-58	22-29	5.6-7.3	0
	58-80	15-28	5.6-7.3	0
136:				
Ankeny, occasionally flooded	0-7	9.2-16	6.1-7.3	0
	7-30	9.2-16	6.1-7.3	0
	30-44	8.6-14	6.1-7.3	0
	44-60	1.8-7.1	6.1-7.8	0-10
212:				
Kennebec, occasionally flooded	0-8	16-23	5.6-7.3	0
	8-54	16-23	6.1-7.3	0
	54-80	20-22	6.1-7.3	0
220:				
Nodaway, occasionally flooded	0-7	15-29	6.1-7.3	0
	7-80	13-27	6.1-7.3	0
229C2:				
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.1-7.3	0
Clarinda, severely eroded	0-4	31-41	5.1-7.3	0
	4-80	26-42	5.1-7.3	0
229D2:				
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.1-7.3	0
Clarinda, severely eroded	0-4	31-41	5.1-7.3	0
	4-80	26-42	5.1-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
247D2:				
Shelby, sandy substratum, moderately eroded	0-5	17-22	5.1-7.3	0
	5-33	20-30	5.1-7.3	0
	33-51	14-21	5.6-7.3	0
	51-80	6.2-15	6.6-8.4	0-20
Hesch, deep, moderately eroded	0-7	11-14	5.1-7.3	0
	7-18	5.4-14	5.6-7.3	0
	18-39	5.1-9.6	5.1-6.5	0
	39-49	1.0-4.3	4.5-6.5	0
	49-80	---	---	---
Hesch, moderately eroded	0-9	5.5-15	5.1-6.5	0
	9-17	14-19	5.1-7.3	0
	17-28	0.5-2.7	4.5-7.3	0
	28-80	---	---	---
269:				
Humeston, occasionally flooded, occasionally ponded	0-11	20-25	5.6-7.3	0
	11-25	17-21	5.1-7.3	0
	25-31	23-27	5.6-7.3	0
	31-72	27-36	5.6-7.3	0
	72-80	23-29	5.6-7.3	0
273B:				
Olmitz	0-7	20-23	5.6-7.3	0
	7-30	19-28	5.1-7.3	0
	30-60	22-28	5.1-7.3	0
289D2:				
Dickman, loamy substratum, moderately eroded	0-6	7.3-13	5.6-7.3	0
	6-19	4.3-12	5.1-6.5	0
	19-46	2.1-6.7	5.1-6.5	0
	46-56	4.3-11	5.1-6.5	0
	56-69	2.1-6.7	5.6-7.3	0
	69-80	8.8-18	5.6-7.3	0
Marshall, moderately eroded	0-7	22-29	5.6-7.3	0
	7-50	21-28	5.6-6.5	0
	50-62	19-27	6.1-7.3	0
	62-80	17-27	6.1-7.3	0
300:				
Bremer, terrace	0-8	23-29	5.6-7.3	0
	8-19	23-29	5.6-7.3	0
	19-42	27-34	5.6-7.3	0
	42-50	23-30	5.6-7.3	0
	50-60	20-30	5.6-7.8	0-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
337D2:				
Dickman, loamy substratum, moderately eroded	0-6	7.3-13	5.6-7.3	0
	6-19	4.3-12	5.1-6.5	0
	19-46	2.1-6.7	5.1-6.5	0
	46-56	4.3-11	5.1-6.5	0
	56-69	2.1-6.7	5.6-7.3	0
	69-80	8.8-18	5.6-7.3	0
Sharpsburg, moderately eroded	0-8	22-27	5.1-6.5	0
	8-21	27-32	5.1-6.5	0
	21-40	21-29	5.6-6.5	0
	40-48	21-28	5.6-6.5	0
	48-80	18-26	5.6-7.3	0
370:				
Sharpsburg	0-8	22-27	5.1-6.5	0
	8-17	24-27	5.1-6.5	0
	17-31	27-31	5.1-6.5	0
	31-38	19-26	5.1-6.5	0
	38-46	19-26	5.6-7.3	0
	46-60	18-27	5.6-7.3	0
370B:				
Sharpsburg	0-8	22-27	5.1-6.5	0
	8-17	24-27	5.1-6.5	0
	17-31	27-31	5.1-6.5	0
	31-38	19-26	5.1-6.5	0
	38-46	19-26	5.6-7.3	0
	46-60	18-27	5.6-7.3	0
371C2:				
Sharpsburg, moderately eroded	0-8	22-27	5.1-6.5	0
	8-21	27-32	5.1-6.5	0
	21-40	21-29	5.6-6.5	0
	40-48	21-28	5.6-6.5	0
	48-80	18-26	5.6-7.3	0
Nira, moderately eroded	0-7	25-28	5.6-7.3	0
	7-12	22-29	5.6-7.3	0
	12-44	20-26	5.6-7.3	0
	44-60	17-23	6.1-7.3	0
	60-80	17-23	5.6-7.3	0
371D2:				
Sharpsburg	0-8	22-27	5.1-6.5	0
	8-17	24-27	5.1-6.5	0
	17-31	27-31	5.1-6.5	0
	31-38	19-26	5.1-6.5	0
	38-46	19-26	5.6-7.3	0
	46-60	18-27	5.6-7.3	0
Sharpsburg, moderately eroded	0-8	22-27	5.1-6.5	0
	8-21	27-32	5.1-6.5	0
	21-40	21-29	5.6-6.5	0
	40-48	21-28	5.6-6.5	0
	48-80	18-26	5.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
371D2:				
Nira, moderately eroded	0-7	25-28	5.6-7.3	0
	7-12	22-29	5.6-7.3	0
	12-44	20-26	5.6-7.3	0
	44-60	17-23	6.1-7.3	0
	60-80	17-23	5.6-7.3	0
371E2:				
Sharpsburg, moderately eroded	0-8	22-27	5.1-6.5	0
	8-21	27-32	5.1-6.5	0
	21-40	21-29	5.6-6.5	0
	40-48	21-28	5.6-6.5	0
	48-80	18-26	5.6-7.3	0
Nira, moderately eroded	0-7	25-28	5.6-7.3	0
	7-12	22-29	5.6-7.3	0
	12-44	20-26	5.6-7.3	0
	44-60	17-23	6.1-7.3	0
	60-80	17-23	5.6-7.3	0
430:				
Ackmore, occasionally flooded	0-6	15-25	5.6-7.3	0
	6-25	15-25	5.6-7.3	0
	25-60	17-32	5.6-7.8	0-10
431B:				
Judson	0-9	20-27	4.5-7.3	0
	9-22	20-27	4.5-7.3	0
	22-28	22-27	5.6-7.3	0
	28-35	23-28	5.6-7.3	0
	35-52	20-25	6.1-7.8	0-10
	52-60	17-25	6.1-7.8	0-10
Ackmore, rarely flooded	0-6	15-25	5.6-7.3	0
	6-25	15-25	5.6-7.3	0
	25-60	17-32	5.6-7.8	0-10
Colo, frequently flooded, overwash	0-7	17-26	6.1-7.8	0-10
	7-15	17-26	6.1-7.3	0
	15-50	25-29	5.6-7.3	0
	50-70	24-28	5.6-7.3	0
	70-80	20-28	5.6-7.3	0
435:				
Zook, occasionally flooded	0-7	26-36	5.6-7.8	0-10
	7-20	26-36	5.6-7.8	0-10
	20-38	26-35	5.6-7.8	0-10
	38-61	28-35	6.1-7.3	0
	61-80	15-33	6.1-7.3	0
Mt. Sterling, occasionally flooded	0-7	15-23	5.6-7.3	0
	7-26	15-24	5.6-7.3	0
	26-54	23-35	4.5-7.3	0
	54-80	23-37	4.5-7.8	0-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
469C2:				
Lamoni, moderately eroded	0-6	22-31	5.1-7.3	0
	6-23	23-41	5.1-6.5	0
	23-55	21-28	5.1-7.3	0
	55-80	21-28	5.6-7.3	0
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.1-7.3	0
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
469C3:				
Lamoni, severely eroded	0-7	22-31	5.1-7.3	0
	7-14	22-40	5.1-6.5	0
	14-48	21-28	5.1-7.3	0
	48-60	21-28	5.6-7.3	0
Clarinda, severely eroded	0-4	31-41	5.1-7.3	0
	4-80	26-42	5.1-7.3	0
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
470D2:				
Lamoni, moderately eroded	0-6	22-31	5.1-7.3	0
	6-23	23-41	5.1-6.5	0
	23-55	21-28	5.1-7.3	0
	55-80	21-28	5.6-7.3	0
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
509B:				
Marshall, terrace	0-7	21-29	5.6-7.3	0
	7-22	23-29	5.6-7.3	0
	22-65	21-28	5.6-6.5	0
	65-71	19-24	5.6-7.3	0
	71-80	17-23	6.1-7.3	0
509C:				
Marshall, terrace	0-7	21-29	5.6-7.3	0
	7-22	23-29	5.6-7.3	0
	22-65	21-28	5.6-6.5	0
	65-71	19-24	5.6-7.3	0
	71-80	17-23	6.1-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
509C2:				
Marshall, terrace, moderately eroded	0-6	21-29	5.6-7.3	0
	6-60	22-28	5.6-6.5	0
	60-80	17-28	6.1-7.3	0
545B:				
Zook	0-7	26-36	5.6-7.8	0-10
	7-20	26-36	5.6-7.8	0-10
	20-38	26-35	5.6-7.8	0-10
	38-61	28-35	6.1-7.3	0
	61-80	15-33	6.1-7.3	0
Ely	0-8	18-30	5.6-7.3	0
	8-32	23-29	5.6-7.3	0
	32-58	22-29	5.6-7.3	0
	58-80	15-28	5.6-7.3	0
Gullied land.				
733:				
Calco, occasionally flooded	0-8	21-30	7.4-8.4	5-20
	8-50	21-29	7.4-8.4	5-20
	50-65	20-29	7.4-8.4	5-20
	65-79	20-28	7.4-8.4	5-20
803:				
Melia, terrace	0-7	17-29	5.6-7.3	0
	7-39	17-29	5.6-7.3	0
	39-76	16-28	5.6-7.8	0-10
	76-80	14-24	6.1-7.8	0-10
824E3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Lamoni, severely eroded	0-7	22-31	5.1-7.3	0
	7-14	22-40	5.1-6.5	0
	14-48	21-28	5.1-7.3	0
	48-60	21-28	5.6-7.3	0
870B:				
Sharpsburg, terrace	0-8	22-27	5.1-6.5	0
	8-17	24-27	5.1-6.5	0
	17-38	28-32	5.1-6.5	0
	38-60	18-27	6.1-7.3	0
1239:				
Corley, terrace	0-10	17-23	5.1-7.3	0
	10-18	17-23	5.1-7.3	0
	18-29	17-20	5.1-7.3	0
	29-60	18-25	5.1-6.5	0
	60-68	17-22	5.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
1239:				
Minden, terrace------	0-7	23-27	5.6-7.3	0
	7-22	23-29	5.6-7.3	0
	22-66	23-28	5.6-7.3	0
	66-80	18-22	5.6-7.3	0
2428:				
Ely----------	0-8	18-30	5.6-7.3	0
	8-32	23-29	5.6-7.3	0
	32-58	22-29	5.6-7.3	0
	58-80	15-28	5.6-7.3	0
Colo, overwash-------	0-7	17-26	6.1-7.8	0-10
	7-15	17-26	6.1-7.3	0
	15-50	25-29	5.6-7.3	0
	50-70	24-28	5.6-7.3	0
	70-80	20-28	5.6-7.3	0
Mt. Sterling---------	0-7	15-23	5.6-7.3	0
	7-26	15-24	5.6-7.3	0
	26-54	23-35	4.5-7.3	0
	54-80	23-37	4.5-7.8	0-10
4946C. Udorthents-Interstate highway				
5030. Pits, limestone quarry				
5040. Udorthents, loamy				
5080. Udorthents, sanitary landfill				
AW. Animal waste lagoon				
SL. Sewage lagoon				
W. Water				
Y8B:				
Judson----------	0-9	20-27	4.5-7.3	0
	9-22	20-27	4.5-7.3	0
	22-28	22-27	5.6-7.3	0
	28-35	23-28	5.6-7.3	0
	35-52	20-25	6.1-7.8	0-10
	52-60	17-25	6.1-7.8	0-10
Y8C:				
Judson----------	0-9	20-27	4.5-7.3	0
	9-22	20-27	4.5-7.3	0
	22-28	22-27	5.6-7.3	0
	28-35	23-28	5.6-7.3	0
	35-52	20-25	6.1-7.8	0-10
	52-60	17-25	6.1-7.8	0-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
Y24C2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Y24D2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Y24D3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Y24E:				
Shelby	0-7	20-29	5.1-7.3	0
	7-11	20-29	5.1-7.3	0
	11-46	23-30	5.1-7.3	0
	46-60	17-27	6.6-8.4	0-20
	60-80	17-27	6.6-8.4	0-20
Y24E2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Y24E3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Y24F2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Y24F3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
Y82C3:				
Adair, severely eroded	0-3	20-31	5.1-7.3	0
	3-26	28-43	5.1-6.5	0
	26-59	21-28	5.1-6.5	0
	59-70	21-28	6.1-7.8	0-10
	70-80	21-28	6.1-7.8	0-10
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Y93D2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10
Y93D3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Adair, severely eroded	0-3	20-31	5.1-7.3	0
	3-26	28-43	5.1-6.5	0
	26-59	21-28	5.1-6.5	0
	59-70	21-28	6.1-7.8	0-10
	70-80	21-28	6.1-7.8	0-10
Y93E2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-8.4	0-20
	76-80	21-28	6.1-7.8	0-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
Y192C2:				
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10
Y192D2:				
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10
Y222C2:				
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.6-8.4	0-20
Y222D2:				
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.1-7.3	0
Y222D3:				
Clarinda, severely eroded	0-4	31-41	5.1-7.3	0
	4-80	26-42	5.1-7.3	0
Z8B:				
Judson	0-9	20-27	4.5-7.3	0
	9-22	20-27	4.5-7.3	0
	22-28	22-27	5.6-7.3	0
	28-35	23-28	5.6-7.3	0
	35-52	20-25	6.1-7.8	0-10
	52-60	17-25	6.1-7.8	0-10
Z8C:				
Judson	0-9	20-27	4.5-7.3	0
	9-22	20-27	4.5-7.3	0
	22-28	22-27	5.6-7.3	0
	28-35	23-28	5.6-7.3	0
	35-52	20-25	6.1-7.8	0-10
	52-60	17-25	6.1-7.8	0-10
Z24D2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Z24D3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
Z24E2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Z24E3:				
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Z24F2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Z82D3:				
Adair, severely eroded	0-3	20-31	5.1-7.3	0
	3-26	28-43	5.1-6.5	0
	26-59	21-28	5.1-6.5	0
	59-70	21-28	6.1-7.8	0-10
	70-80	21-28	6.1-7.8	0-10
Shelby, severely eroded	0-2	20-28	5.1-7.3	0
	2-48	20-30	5.1-7.3	0
	48-62	17-27	6.6-8.4	0-20
	62-80	17-27	6.6-8.4	0-20
Z93C2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10
Z93D2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
Z93E2:				
Shelby, moderately eroded	0-7	20-29	5.1-7.3	0
	7-37	23-30	5.1-7.3	0
	37-45	17-27	6.6-8.4	0-20
	45-80	17-27	6.6-8.4	0-20
Adair, moderately eroded	0-7	20-31	5.1-7.3	0
	7-17	28-43	5.1-6.5	0
	17-60	21-28	5.1-6.5	0
	60-76	21-28	6.1-7.8	0-10
	76-80	21-28	6.1-7.8	0-10
Z192C3:				
Adair, severely eroded	0-3	20-31	5.1-7.3	0
	3-26	28-43	5.1-6.5	0
	26-59	21-28	5.1-6.5	0
	59-70	21-28	6.1-7.8	0-10
	70-80	21-28	6.1-7.8	0-10
Z222D2:				
Clarinda, moderately eroded	0-6	21-31	5.1-7.3	0
	6-80	26-42	5.1-7.3	0

Water Features

The table described in this section gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

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

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual

weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

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

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

Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
7:									
Wiota, rarely flooded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Rare
		March	4.5-6.5	>6.0	---	---	None	Brief	Rare
		April	4.0-6.0	>6.0	---	---	None	Brief	Rare
		May	4.5-6.5	>6.0	---	---	None	Brief	Rare
		June	5.0-6.7	>6.0	---	---	None	Brief	Rare
		July	6.0-6.7	>6.0	---	---	None	Brief	Rare
		August	6.5-6.7	>6.0	---	---	None	Brief	Rare
		September	6.5-6.7	>6.0	---	---	None	Brief	Rare
		October	6.5-6.7	>6.0	---	---	None	Brief	Rare
		November	5.5-6.7	>6.0	---	---	None	Brief	Rare
		December	6.0-6.7	>6.0	---	---	None	---	None
7B:									
Wiota, rarely flooded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Rare
		March	4.5-6.5	>6.0	---	---	None	Brief	Rare
		April	4.0-6.0	>6.0	---	---	None	Brief	Rare
		May	4.5-6.5	>6.0	---	---	None	Brief	Rare
		June	5.0-6.7	>6.0	---	---	None	Brief	Rare
		July	6.0-6.7	>6.0	---	---	None	Brief	Rare
		August	6.5-6.7	>6.0	---	---	None	Brief	Rare
		September	6.5-6.7	>6.0	---	---	None	Brief	Rare
		October	6.5-6.7	>6.0	---	---	None	Brief	Rare
		November	5.5-6.7	>6.0	---	---	None	Brief	Rare
		December	6.0-6.7	>6.0	---	---	None	---	None
9:									
Marshall	C								
		Jan-Dec	---	---	---	---	None	---	None
9B:									
Marshall	C								
		Jan-Dec	---	---	---	---	None	---	None
9C2:									
Marshall, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
9C3:									
Marshall, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
9D2:									
Marshall, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
15B:									
Olmitz	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Ely	B/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	2.0-4.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Zook	D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
16:									
Nodaway, occasionally flooded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
		May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
		August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		September	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
16:									
Kennebec, occasionally flooded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
		May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
		August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		September	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		December	6.0-6.7	>6.0	---	---	None	---	None
43:									
Bremer, rarely flooded	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Brief	Rare
		March	0.5-2.0	>6.0	---	---	None	Brief	Rare
		April	0.0-1.0	>6.0	---	---	None	Brief	Rare
		May	0.5-1.5	>6.0	---	---	None	Brief	Rare
		June	1.0-2.0	>6.0	---	---	None	Brief	Rare
		July	2.0-3.0	>6.0	---	---	None	Brief	Rare
		August	2.5-3.5	>6.0	---	---	None	Brief	Rare
		September	3.0-4.0	>6.0	---	---	None	Brief	Rare
		October	2.5-3.5	>6.0	---	---	None	Brief	Rare
		November	1.5-3.0	>6.0	---	---	None	Brief	Rare
		December	2.0-3.5	>6.0	---	---	None	---	None
54:									
Zook, occasionally flooded	D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Brief	Occasional
		August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
		October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
54+:									
Zook, occasionally flooded, overwash	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Brief	Occasional
		August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
		October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
88:									
Nevin, rarely flooded	C/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Brief	Rare
		March	1.5-4.0	>6.0	---	---	None	Brief	Rare
		April	1.0-3.5	>6.0	---	---	None	Brief	Rare
		May	1.5-4.0	>6.0	---	---	None	Brief	Rare
		June	2.0-4.5	>6.0	---	---	None	Brief	Rare
		July	3.0-5.5	>6.0	---	---	None	Brief	Rare
		August	3.5-6.0	>6.0	---	---	None	Brief	Rare
		September	4.0-6.5	>6.0	---	---	None	Brief	Rare
		October	3.5-6.0	>6.0	---	---	None	Brief	Rare
		November	2.5-5.0	>6.0	---	---	None	Brief	Rare
		December	3.0-5.5	>6.0	---	---	None	---	None
99D2:									
Exira, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
99D3:									
Exira, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
99E2:									
Exira, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
99E3:									
Exira, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
113B:									
Colo, frequently flooded, overwash	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
		April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
		July	2.0-3.0	>6.0	---	---	None	Very brief	Frequent
		August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
		October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
Ely	B/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	2.0-4.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
136:									
Ankeny, occasionally flooded	A								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	Brief	Occasional
		March	---	---	---	---	None	Brief	Occasional
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	---	---	---	---	None	Brief	Occasional
		December	---	---	---	---	None	---	None
212:									
Kennebec, occasionally flooded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
		May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
		August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		September	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		December	6.0-6.7	>6.0	---	---	None	---	None
220:									
Nodaway, occasionally flooded	B								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
		May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
		June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
		July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
		August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		September	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
		November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
		December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
229C2:									
Clarinda, moderately eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Clarinda, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
229D2:									
Clarinda, moderately eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Clarinda, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
247D2:									
Shelby, sandy substratum, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Hesch, deep, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Hesch, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
269:									
Humeston, occasionally flooded, occasionally ponded	C/D								
		January	0.0	>6.0	---	---	None	---	None
		February	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		March	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		April	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		May	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		June	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		July	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		August	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		September	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		October	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		November	0.0	>6.0	0.0-1.0	Brief	Occasional	Brief	Occasional
		December	0.0	>6.0	---	---	None	---	None
273B:									
Olmitz	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
289D2:									
Dickman, loamy substratum, moderately eroded	A								
		Jan-Dec	---	---	---	---	None	---	None
Marshall, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
300:									
Bremer, terrace	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
337D2:									
Dickman, loamy substratum, moderately eroded	A								
		Jan-Dec	---	---	---	---	None	---	None
Sharpsburg, moderately eroded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
370:									
Sharpsburg	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
370B:									
Sharpsburg----------	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
371C2:									
Sharpsburg, moderately eroded----------	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Nira, moderately eroded---	C								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
371D2:									
Sharpsburg----------	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
371D2:									
Sharpsburg, moderately eroded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Nira, moderately eroded	C								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
371E2:									
Sharpsburg, moderately eroded	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
Nira, moderately eroded	C								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	3.5-5.5	>6.0	---	---	None	---	None
		March	2.5-4.5	>6.0	---	---	None	---	None
		April	2.0-4.0	>6.0	---	---	None	---	None
		May	2.5-4.5	>6.0	---	---	None	---	None
		June	3.0-5.0	>6.0	---	---	None	---	None
		July	4.0-6.0	>6.0	---	---	None	---	None
		August	4.5-6.5	>6.0	---	---	None	---	None
		September	5.0-6.7	>6.0	---	---	None	---	None
		October	4.5-6.5	>6.0	---	---	None	---	None
		November	3.5-5.5	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
430:									
Ackmore, occasionally flooded	C/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Brief	Occasional
		March	1.5-4.0	>6.0	---	---	None	Brief	Occasional
		April	1.0-3.5	>6.0	---	---	None	Brief	Occasional
		May	1.5-4.0	>6.0	---	---	None	Brief	Occasional
		June	2.0-4.5	>6.0	---	---	None	Brief	Occasional
		July	3.0-5.5	>6.0	---	---	None	Brief	Occasional
		August	3.5-6.0	>6.0	---	---	None	Brief	Occasional
		September	4.0-6.5	>6.0	---	---	None	Brief	Occasional
		October	3.5-6.0	>6.0	---	---	None	Brief	Occasional
		November	2.5-5.0	>6.0	---	---	None	Brief	Occasional
		December	3.0-5.5	>6.0	---	---	None	---	None
431B:									
Judson	C								
		Jan-Dec	---	---	---	---	None	---	None
Ackmore, rarely flooded	C/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	Very brief	Rare
		March	1.5-4.0	>6.0	---	---	None	Very brief	Rare
		April	1.0-3.5	>6.0	---	---	None	Very brief	Rare
		May	1.5-4.0	>6.0	---	---	None	Very brief	Rare
		June	2.0-4.5	>6.0	---	---	None	Very brief	Rare
		July	3.0-5.5	>6.0	---	---	None	Very brief	Rare
		August	3.5-6.0	>6.0	---	---	None	Very brief	Rare
		September	4.0-6.5	>6.0	---	---	None	Very brief	Rare
		October	3.5-6.0	>6.0	---	---	None	Very brief	Rare
		November	2.5-5.0	>6.0	---	---	None	Very brief	Rare
		December	3.0-5.5	>6.0	---	---	None	---	None
Colo, frequently flooded, overwash	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
		April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
		July	2.0-3.0	>6.0	---	---	None	Very brief	Frequent
		August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
		October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
435:									
Zook, occasionally flooded	D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Brief	Occasional
		August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
		October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
Mt. Sterling, occasionally flooded	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Brief	Occasional
		June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Brief	Occasional
		August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
		October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		December	2.0-3.5	>6.0	---	---	None	---	None
469C2:									
Lamoni, moderately eroded	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Clarinda, moderately eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
469C3:									
Lamoni, severely eroded---	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Clarinda, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Shelby, severely eroded---	C								
		Jan-Dec	---	---	---	---	None	---	None
470D2:									
Lamoni, moderately eroded	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
509B:									
Marshall, terrace---------	C								
		Jan-Dec	---	---	---	---	None	---	None
509C:									
Marshall, terrace---------	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
509C2:									
Marshall, terrace, moderately eroded	B								
		Jan-Dec	---	---	---	---	None	---	None
545B:									
Zook	D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	0.5-2.0	>6.0	---	---	None	---	None
		April	0.0-1.0	>6.0	---	---	None	---	None
		May	0.5-1.5	>6.0	---	---	None	---	None
		June	1.0-2.0	>6.0	---	---	None	---	None
		July	2.0-3.0	>6.0	---	---	None	---	None
		August	2.5-3.5	>6.0	---	---	None	---	None
		September	3.0-4.0	>6.0	---	---	None	---	None
		October	2.5-3.5	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	2.0-3.5	>6.0	---	---	None	---	None
Ely	B/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	2.0-4.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Gullied land.									
733:									
Calco, occasionally flooded	C/D								
		January	0.0-1.0	>6.0	---	---	None	---	None
		February	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		March	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		June	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		July	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		August	0.0-6.0	>6.0	---	---	None	Brief	Occasional
		September	0.0-6.0	>6.0	---	---	None	Brief	Occasional
		October	0.0-6.0	>6.0	---	---	None	Brief	Occasional
		November	0.0-1.0	>6.0	---	---	None	Brief	Occasional
		December	0.0-1.0	>6.0	---	---	None	---	None
803:									
Melia, terrace	C								
		Jan-Dec	---	---	---	---	None	---	None
824E3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
824E3:									
Lamoni, severely eroded---	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
870B:									
Sharpsburg, terrace-------	C								
		January	6.0-6.7	>6.0	---	---	None	---	None
		February	5.5-6.7	>6.0	---	---	None	---	None
		March	4.5-6.5	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.5-6.5	>6.0	---	---	None	---	None
		June	5.0-6.7	>6.0	---	---	None	---	None
		July	6.0-6.7	>6.0	---	---	None	---	None
		August	6.5-6.7	>6.0	---	---	None	---	None
		September	6.5-6.7	>6.0	---	---	None	---	None
		October	6.5-6.7	>6.0	---	---	None	---	None
		November	5.5-6.7	>6.0	---	---	None	---	None
		December	6.0-6.7	>6.0	---	---	None	---	None
1239:									
Corley, terrace----------	C/D								
		January	0.0	>6.0	---	---	---	---	None
		February	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		September	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		October	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		November	0.0	>6.0	0.0-1.0	Brief	Frequent	---	None
		December	0.0	>6.0	---	---	---	---	None
Minden, terrace----------	C/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	2.0-4.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
2428:									
Ely	B/D								
		January	3.0-5.5	>6.0	---	---	None	---	None
		February	2.5-5.0	>6.0	---	---	None	---	None
		March	1.5-4.0	>6.0	---	---	None	---	None
		April	1.0-3.5	>6.0	---	---	None	---	None
		May	1.5-4.0	>6.0	---	---	None	---	None
		June	2.0-4.5	>6.0	---	---	None	---	None
		July	3.0-5.5	>6.0	---	---	None	---	None
		August	3.5-6.0	>6.0	---	---	None	---	None
		September	4.0-6.5	>6.0	---	---	None	---	None
		October	3.5-6.0	>6.0	---	---	None	---	None
		November	2.5-5.0	>6.0	---	---	None	---	None
		December	3.0-5.5	>6.0	---	---	None	---	None
Colo, overwash	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
		April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
		July	2.0-3.0	>6.0	---	---	None	Very brief	Frequent
		August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
		October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
Mt. Sterling	C/D								
		January	2.0-3.5	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
		April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
		July	2.0-3.0	>6.0	---	---	None	Very brief	Frequent
		August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
		October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
		December	2.0-3.5	>6.0	---	---	None	---	None
4946C. Udorthents-Interstate highway									
5030. Pits, limestone quarry									
5040. Udorthents, loamy									
5080. Udorthents, sanitary landfill									
AW. Animal waste lagoon									
SL. Sewage lagoon									

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
W. Water									
Y8B:									
Judson	C								
		Jan-Dec	---	---	---	---	None	---	None
Y8C:									
Judson	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24C2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24D2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24D3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24E:									
Shelby	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24E2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24E3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24F2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y24F3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Y82C3:									
Adair, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Y93D2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Y93D3:									
Shelby, severely eroded---	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, severely eroded----	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Y93E2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Y192C2:									
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Y192D2:									
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Y222C2:									
Clarinda, moderately eroded----------	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Y222D2:									
Clarinda, moderately eroded----------	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Y222D3:									
Clarinda, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None
Z8B:									
Judson	C								
		Jan-Dec	---	---	---	---	None	---	None
Z8C:									
Judson	C								
		Jan-Dec	---	---	---	---	None	---	None
Z24D2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Z24D3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Z24E2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Z24E3:									
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Z24F2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Z82D3:									
Adair, severely eroded	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Shelby, severely eroded	C								
		Jan-Dec	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Z93C2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Z93D2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Z93E2:									
Shelby, moderately eroded	C								
		Jan-Dec	---	---	---	---	None	---	None
Adair, moderately eroded--	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Z192C3:									
Adair, severely eroded----	D								
		January	---	---	---	---	None	---	None
		February	---	---	---	---	None	---	None
		March	1.5-2.0	2.5	---	---	None	---	None
		April	1.5-2.0	2.5	---	---	None	---	None
		May	1.5-2.0	2.5	---	---	None	---	None
		June	2.0-2.5	2.5	---	---	None	---	None
		July	---	---	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.5	---	---	None	---	None
		November	1.5-2.0	2.5	---	---	None	---	None
		December	1.5-2.0	2.5	---	---	None	---	None
Z222D2:									
Clarinda, moderately eroded----------	D								
		January	---	---	---	---	None	---	None
		February	1.5-2.0	2.0	---	---	None	---	None
		March	0.0-1.0	2.0	---	---	None	---	None
		April	0.0-1.0	2.0	---	---	None	---	None
		May	0.5-1.5	2.0	---	---	None	---	None
		June	1.0-1.5	2.0	---	---	None	---	None
		July	1.5-2.0	2.0	---	---	None	---	None
		August	---	---	---	---	None	---	None
		September	---	---	---	---	None	---	None
		October	1.0-1.5	2.0	---	---	None	---	None
		November	1.5-2.0	2.0	---	---	None	---	None
		December	1.5-2.0	2.0	---	---	None	---	None

Soil Features

The table described in this section gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for 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 the 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 to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete 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 also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
7:						
Wiota, rarely flooded	---	---	---	High	High	Moderate
7B:						
Wiota, rarely flooded	---	---	---	High	High	Moderate
9:						
Marshall	---	---	---	High	Moderate	Moderate
9B:						
Marshall	---	---	---	High	Moderate	Moderate
9C2:						
Marshall, moderately eroded	---	---	---	High	Moderate	Low
9C3:						
Marshall, severely eroded	---	---	---	High	Moderate	Low
9D2:						
Marshall, moderately eroded	---	---	---	High	Moderate	Low
15B:						
Olmitz	---	---	---	Moderate	High	Low
Ely	---	---	---	High	High	Low
Zook	---	---	---	High	High	Low
16:						
Nodaway, occasionally flooded	---	---	---	High	High	Low
Kennebec, occasionally flooded	---	---	---	High	Moderate	Low
43:						
Bremer, rarely flooded	---	---	---	High	High	Low
54:						
Zook, occasionally flooded	---	---	---	High	High	Low
54+:						
Zook, occasionally flooded, overwash	---	---	---	High	High	Low
88:						
Nevin, rarely flooded	---	---	---	High	High	Moderate
99D2:						
Exira, moderately eroded	---	---	---	High	Moderate	Moderate
99D3:						
Exira, severely eroded	---	---	---	High	Moderate	Moderate
99E2:						
Exira, moderately eroded	---	---	---	High	Moderate	Moderate
99E3:						
Exira, severely eroded	---	---	---	High	Moderate	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
113B:						
Colo, frequently flooded, overwash	---	---	---	High	High	Low
Ely	---	---	---	High	High	Low
136:						
Ankeny, occasionally flooded	---	---	---	Moderate	Low	Low
212:						
Kennebec, occasionally flooded	---	---	---	High	Moderate	Low
220:						
Nodaway, occasionally flooded	---	---	---	High	High	Low
229C2:						
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low
Clarinda, severely eroded	Abrupt textural change	4	---	High	High	Low
229D2:						
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low
Clarinda, severely eroded	Abrupt textural change	4	---	High	High	Low
247D2:						
Shelby, sandy substratum, moderately eroded	---	---	---	Moderate	Low	Moderate
Hesch, deep, moderately eroded	Paralithic bedrock	52	Extremely weakly cemented	Moderate	Low	Low
Hesch, moderately eroded	Paralithic bedrock	30	Extremely weakly cemented	Moderate	Low	Moderate
269:						
Humeston, occasionally flooded, occasionally ponded	---	---	---	High	Moderate	Low
273B:						
Olmitz	---	---	---	Moderate	High	Low
289D2:						
Dickman, loamy substratum, moderately eroded	---	---	---	Low	Moderate	Moderate
Marshall, moderately eroded	---	---	---	High	Moderate	Low
300:						
Bremer, terrace	---	---	---	High	High	Low
337D2:						
Dickman, loamy substratum, moderately eroded	---	---	---	Low	Low	Moderate
Sharpsburg, moderately eroded	---	---	---	High	High	Moderate
370:						
Sharpsburg	---	---	---	High	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
370B:						
Sharpsburg	---	---	---	High	High	Moderate
371C2:						
Sharpsburg, moderately eroded	---	---	---	High	High	Moderate
Nira, moderately eroded	---	---	---	High	High	Low
371D2:						
Sharpsburg	---	---	---	High	High	Moderate
Sharpsburg, moderately eroded	---	---	---	High	High	Moderate
Nira, moderately eroded	---	---	---	High	High	Low
371E2:						
Sharpsburg, moderately eroded	---	---	---	High	High	Moderate
Nira, moderately eroded	---	---	---	High	High	Low
430:						
Ackmore, occasionally flooded	---	---	---	High	High	Low
431B:						
Judson	---	---	---	High	Moderate	Moderate
Ackmore, rarely flooded	---	---	---	High	High	Low
Colo, frequently flooded, overwash	---	---	---	High	High	Low
435:						
Zook, occasionally flooded	---	---	---	High	High	Low
Mt. Sterling, occasionally flooded	---	---	---	High	High	Low
469C2:						
Lamoni, moderately eroded	Abrupt textural change	6	---	Moderate	High	Low
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
469C3:						
Lamoni, severely eroded	Abrupt textural change	8	---	Moderate	High	Low
Clarinda, severely eroded	Abrupt textural change	4	---	High	High	Low
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
470D2:						
Lamoni, moderately eroded	Abrupt textural change	6	---	Moderate	High	Low
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
509B:						
Marshall, terrace	---	---	---	High	Moderate	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
509C:						
Marshall, terrace	---	---	---	High	Moderate	Moderate
509C2:						
Marshall, terrace, moderately eroded	---	---	---	High	Moderate	Low
545B:						
Zook	---	---	---	High	High	Low
Ely	---	---	---	High	High	Low
Gullied land.						
733:						
Calco, occasionally flooded	---	---	---	High	Moderate	Low
803:						
Melia, terrace	---	---	---	High	Moderate	Low
824E3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Lamoni, severely eroded	Abrupt textural change	8	---	Moderate	High	Low
870B:						
Sharpsburg, terrace	---	---	---	High	High	Moderate
1239:						
Corley, terrace	---	---	---	High	Moderate	Moderate
Minden, terrace	---	---	---	High	High	Low
2428:						
Ely	---	---	---	High	High	Low
Colo, overwash	---	---	---	High	High	Low
Mt. Sterling	---	---	---	High	High	Low
4946C.						
Udorthents-Interstate highway						
5030.						
Pits, limestone quarry						
5040.						
Udorthents, loamy						
5080.						
Udorthents, sanitary landfill						
AW.						
Animal waste lagoon						
SL.						
Sewage lagoon						
W.						
Water						

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
Y8B:						
Judson	---	---	---	High	Moderate	Moderate
Y8C:						
Judson	---	---	---	High	Moderate	Moderate
Y24C2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Y24D2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Y24D3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Y24E:						
Shelby	---	---	---	Moderate	Moderate	Moderate
Y24E2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Y24E3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Y24F2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Y24F3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Y82C3:						
Adair, severely eroded	Abrupt textural change	3	---	High	High	Moderate
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Y93D2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Y93D3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Adair, severely eroded	Abrupt textural change	3	---	High	High	Moderate
Y93E2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Y192C2:						
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Y192D2:						
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
Y222C2:						
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low
Y222D2:						
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low
Y222D3:						
Clarinda, severely eroded	Abrupt textural change	4	---	High	High	Low
Z8B:						
Judson	---	---	---	High	Moderate	Moderate
Z8C:						
Judson	---	---	---	High	Moderate	Moderate
Z24D2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Z24D3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Z24E2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Z24E3:						
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Z24F2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Z82D3:						
Adair, severely eroded	Abrupt textural change	3	---	High	High	Moderate
Shelby, severely eroded	---	---	---	Moderate	Moderate	Low
Z93C2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Z93D2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Z93E2:						
Shelby, moderately eroded	---	---	---	Moderate	Moderate	Low
Adair, moderately eroded	Abrupt textural change	8	---	High	High	Moderate
Z192C3:						
Adair, severely eroded	Abrupt textural change	3	---	High	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
Z222D2:						
Clarinda, moderately eroded	Abrupt textural change	6	---	High	High	Low

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