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Conservation
Service

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 Winneshiek County, Iowa

Part II



Iowa Department of
Agriculture and
Land Stewardship

IOWA STATE UNIVERSITY

Iowa Agriculture and Home Economics
Experiment Station

IOWA STATE UNIVERSITY

University Extension



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.

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 (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2003. Soil names and descriptions were approved in 2004. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2004. The most current official data are available through the NRCS Web Soil Survey (<http://soils.usda.gov>).

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 Winneshiek County Soil and Water Conservation District.

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

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Cover: Scenic view from atop the St. Peter sandstone formation in northeastern Winneshiek County. Fayette soils are on the ridgetop and the upper side slopes, and Village soils are on the lower side slopes.

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 Winneshiek 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 all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of 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
Allamakee-----	Fine-silty over clayey, mixed, superactive, mesic Mollic HapludalFs
Ankeny-----	Coarse-loamy, mixed, superactive, mesic Cumulic Hapludolls
Arenzville-----	Coarse-silty, mixed, superactive, nonacid, mesic Typic Udifluvents
Atkinson-----	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Atterberry-----	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Backbone-----	Coarse-loamy, mixed, superactive, mesic Mollic HapludalFs
Bearpen-----	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Bertrand-----	Fine-silty, mixed, superactive, mesic Typic HapludalFs
Billett-----	Coarse-loamy, mixed, superactive, mesic Mollic HapludalFs
Boone-----	Mesic, uncoated Typic Quartzipsamments
Burkhardt-----	Sandy, mixed, mesic Typic Hapludolls
Calamine-----	Fine, mixed, superactive, mesic Typic Argiaquolls
Canoe-----	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Chelsea-----	Mixed, mesic Lamellic Udipsamments
Clyde-----	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Coggon-----	Fine-loamy, mixed, superactive, mesic Oxyaquic HapludalFs
Coland-----	Fine-loamy, mixed, superactive, mesic Cumulic Endoaquolls
Dickinson-----	Coarse-loamy, mixed, superactive, mesic Typic Hapludolls
Donnan-----	Fine-loamy over clayey, mixed, superactive, mesic Aquollic HapludalFs
Downs-----	Fine-silty, mixed, superactive, mesic Mollic HapludalFs
Dubuque-----	Fine-silty, mixed, superactive, mesic Typic HapludalFs
Dunkerton-----	Coarse-loamy, mixed, superactive, mesic Aquollic HapludalFs
Eitzen-----	Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Exette-----	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Fayette-----	Fine-silty, mixed, superactive, mesic Typic HapludalFs
Festina-----	Fine-silty, mixed, superactive, mesic Mollic HapludalFs
Floyd-----	Fine-loamy, mixed, superactive, mesic Aquic Hapludolls
Frankville-----	Fine-silty, mixed, superactive, mesic Mollic HapludalFs
Hayfield-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Aquollic HapludalFs
Huntsville-----	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Ion-----	Coarse-silty, mixed (calcareous), mesic Mollic Udifluvents
Jacwin-----	Fine-loamy over clayey, mixed, superactive, mesic Aquic Hapludolls
Kasson-----	Fine-loamy, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs
Klossner-----	Loamy, mixed, euic, mesic Terric Haplosaprists
Lacrescent-----	Loamy-skeletal, mixed, superactive, mesic Typic Hapludolls
Lawson-----	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Lilah-----	Mixed, mesic Psammentic Hapludalfs
Marlean-----	Loamy-skeletal, mixed, superactive, mesic Typic Hapludolls
*Marlean-----	Loamy-skeletal, mixed, superactive, mesic Mollic Hapludalfs
Marquis-----	Fine-loamy, mixed, superactive, mesic Oxyaquic Hapludolls
Marshan-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Endoaquolls
Nordness-----	Loamy, mixed, superactive, mesic Lithic Hapludalfs
Oran-----	Fine-loamy, mixed, superactive, mesic Aquollic Hapludalfs
Orwood-----	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs
*Orwood-----	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
Ossian-----	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Ostrander-----	Fine-loamy, mixed, superactive, mesic Typic Hapludolls
Otter-----	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Paintcreek-----	Fine, mixed, superactive, mesic Typic Hapludalfs
Racine-----	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs
Renova-----	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
Rockton-----	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
*Saude-----	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Dystric Eutrudepts
Sparta-----	Sandy, mixed, mesic Entic Hapludolls
Spillville-----	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Tama-----	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Terril-----	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Turlin-----	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Udifluvents-----	Coarse-loamy, mixed, nonacid, mesic Mollic Udifluvents
Udorthents-----	Udorthents
Village-----	Fine-silty over clayey, mixed, superactive, mesic Typic Hapludalfs
Volney-----	Loamy-skeletal, mixed, superactive, mesic Cumulic Hapludolls
Waukee-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludolls
Whalan-----	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
Winneshiek-----	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs
Worthen-----	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Yellowriver-----	Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
27B	Terril loam, 2 to 5 percent slopes-----	445	0.1
41	Sparta loamy fine sand, 0 to 2 percent slopes-----	109	*
41B	Sparta loamy fine sand, 2 to 5 percent slopes-----	111	*
41D	Sparta loamy fine sand, 5 to 14 percent slopes-----	114	*
63B	Chelsea loamy fine sand, 2 to 5 percent slopes-----	207	*
63D	Chelsea loamy fine sand, 5 to 14 percent slopes-----	244	*
84	Clyde silt loam, 0 to 3 percent slopes-----	6,153	1.4
85	Eitzen silt loam, 0 to 2 percent slopes, occasionally flooded-----	941	0.2
98	Huntsville silt loam, 0 to 2 percent slopes, occasionally flooded-----	412	*
98B	Huntsville silt loam, 2 to 5 percent slopes, occasionally flooded-----	331	*
109B	Backbone sandy loam, 2 to 5 percent slopes-----	424	*
109C	Backbone sandy loam, 5 to 9 percent slopes-----	464	0.1
109D	Backbone sandy loam, 9 to 14 percent slopes-----	176	*
135	Coland silty clay loam, 0 to 2 percent slopes, occasionally flooded-----	2,543	0.6
136B	Ankeny fine sandy loam, 2 to 5 percent slopes-----	377	*
162B	Downs silt loam, 2 to 5 percent slopes-----	18,788	4.3
162C	Downs silt loam, 5 to 9 percent slopes-----	44,604	10.1
162D	Downs silt loam, 9 to 14 percent slopes-----	17,747	4.0
162E2	Downs silt loam, 14 to 18 percent slopes, moderately eroded-----	3,309	0.7
163B	Fayette silt loam, 2 to 5 percent slopes-----	9,983	2.3
163C2	Fayette silt loam, 5 to 9 percent slopes, moderately eroded-----	42,569	9.6
163D2	Fayette silt loam, 9 to 14 percent slopes, moderately eroded-----	42,060	9.5
163E2	Fayette silt loam, 14 to 18 percent slopes, moderately eroded-----	17,392	3.9
163F	Fayette silt loam, 18 to 25 percent slopes-----	2,792	0.6
163G	Fayette silt loam, 25 to 40 percent slopes-----	432	*
175B	Dickinson sandy loam, 2 to 5 percent slopes-----	2,041	0.5
177C2	Saude loam, 5 to 9 percent slopes, moderately eroded-----	263	*
178	Waukee loam, 0 to 2 percent slopes-----	5,169	1.2
178B	Waukee loam, 2 to 5 percent slopes-----	3,189	0.7
196	Volney channery silt loam, 0 to 2 percent slopes, occasionally flooded---	463	0.1
196+	Volney silt loam, 0 to 2 percent slopes, occasionally flooded, overwash--	337	*
196B	Volney channery silt loam, 2 to 5 percent slopes, rarely flooded-----	318	*
198B	Floyd loam, 1 to 4 percent slopes-----	9,915	2.2
221	Klossner muck, 0 to 2 percent slopes-----	584	0.1
221+	Klossner muck, 0 to 2 percent slopes, occasionally flooded, overwash-----	317	*
235	Turlin-Coland complex, 0 to 3 percent slopes, occasionally flooded-----	506	0.1
241B	Lilah-Dickinson complex, 2 to 5 percent slopes-----	1,085	0.2
241C	Lilah-Dickinson complex, 5 to 9 percent slopes-----	1,670	0.4
241D	Lilah-Dickinson complex, 9 to 14 percent slopes-----	337	*
285B	Burkhardt loam, 2 to 5 percent slopes-----	129	*
285F	Burkhardt loam, 14 to 25 percent slopes-----	844	0.2
291B	Atterberry silt loam, 1 to 4 percent slopes-----	531	0.1
302B	Coggon silt loam, 2 to 5 percent slopes-----	841	0.2
302C	Coggon silt loam, 5 to 9 percent slopes-----	385	*
302C2	Coggon silt loam, 5 to 9 percent slopes, moderately eroded-----	195	*
320	Arenzville silt loam, 0 to 2 percent slopes, occasionally flooded-----	648	0.1
391B	Clyde-Floyd complex, 1 to 4 percent slopes-----	2,941	0.7
394B	Ostrander silt loam, 2 to 5 percent slopes-----	2,538	0.6
394C	Ostrander silt loam, 5 to 9 percent slopes-----	281	*
395B	Marquis loam, 2 to 5 percent slopes-----	649	0.1
444	Jacwin loam, 0 to 2 percent slopes-----	404	*
444B	Jacwin loam, 2 to 5 percent slopes-----	2,523	0.6
444C	Jacwin loam, 5 to 9 percent slopes-----	667	0.2
468B	Dunkerton sandy loam, 2 to 5 percent slopes-----	287	*
471	Oran loam, 0 to 2 percent slopes-----	372	*
471B	Oran loam, 2 to 5 percent slopes-----	1,489	0.3
480B	Orwood silt loam, 2 to 5 percent slopes-----	390	*
480C2	Orwood silt loam, 5 to 9 percent slopes, moderately eroded-----	2,429	0.6
480D2	Orwood silt loam, 9 to 14 percent slopes, moderately eroded-----	2,399	0.5
480E2	Orwood silt loam, 14 to 18 percent slopes, moderately eroded-----	1,237	0.3
480E3	Orwood silt loam, 14 to 18 percent slopes, severely eroded-----	123	*
480F2	Orwood silt loam, 18 to 25 percent slopes, moderately eroded-----	474	0.1

See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
482B	Racine loam, 2 to 5 percent slopes-----	10,459	2.4
484	Lawson silt loam, 1 to 3 percent slopes, occasionally flooded-----	539	0.1
485	Spillville loam, 0 to 2 percent slopes, occasionally flooded-----	1,346	0.3
487B	Otter-Worthen complex, 1 to 4 percent slopes-----	11,177	2.5
489	Ossian silt loam, 0 to 3 percent slopes, occasionally flooded-----	2,425	0.5
491D2	Renova loam, 9 to 14 percent slopes, moderately eroded-----	317	*
491E2	Renova loam, 14 to 18 percent slopes, moderately eroded-----	511	0.1
499D	Nordness silt loam, 5 to 14 percent slopes-----	1,952	0.4
499G	Nordness silt loam, 14 to 40 percent slopes-----	6,322	1.4
512B	Marlean loam, 2 to 5 percent slopes-----	1,338	0.3
512C	Marlean loam, 5 to 9 percent slopes-----	2,591	0.6
512C2	Marlean loam, 5 to 9 percent slopes, moderately eroded-----	4,130	0.9
512D2	Marlean loam, 9 to 14 percent slopes, moderately eroded-----	5,096	1.2
512E2	Marlean loam, 14 to 18 percent slopes, moderately eroded-----	2,913	0.7
582B	Kasson loam, 2 to 5 percent slopes-----	9,606	2.2
582C	Kasson loam, 5 to 9 percent slopes-----	5,096	1.2
582C2	Kasson loam, 5 to 9 percent slopes, moderately eroded-----	2,469	0.6
626	Hayfield loam, 0 to 3 percent slopes-----	732	0.2
762B	Downs-Tama complex, 2 to 5 percent slopes-----	5,205	1.2
762C	Downs-Tama complex, 5 to 9 percent slopes-----	2,426	0.5
775B	Billett sandy loam, 2 to 5 percent slopes-----	623	0.1
775C	Billett sandy loam, 5 to 9 percent slopes-----	282	*
775D	Billett sandy loam, 9 to 14 percent slopes-----	125	*
782B	Donnan loam, 2 to 5 percent slopes-----	204	*
793	Bertrand silt loam, 0 to 2 percent slopes-----	233	*
793B	Bertrand silt loam, 2 to 5 percent slopes-----	420	*
806B	Whalan silt loam, 2 to 5 percent slopes-----	1,086	0.2
806C2	Whalan silt loam, 5 to 9 percent slopes, moderately eroded-----	864	0.2
806D	Whalan silt loam, 9 to 14 percent slopes-----	385	*
813B	Atkinson loam, 2 to 5 percent slopes-----	521	0.1
814	Rockton loam, 0 to 2 percent slopes-----	627	0.1
814B	Rockton loam, 2 to 5 percent slopes-----	4,509	1.0
814C	Rockton loam, 5 to 9 percent slopes-----	1,506	0.3
814D	Rockton loam, 9 to 14 percent slopes-----	336	*
837D2	Village silt loam, 9 to 14 percent slopes, moderately eroded-----	1,654	0.4
837E2	Village silt loam, 14 to 18 percent slopes, moderately eroded-----	2,345	0.5
838D	Allamakee silt loam, 9 to 14 percent slopes-----	282	*
838E	Allamakee silt loam, 14 to 18 percent slopes-----	294	*
840E	Lacrescent cobbly silty clay loam, 5 to 18 percent slopes-----	71	*
840G	Lacrescent cobbly silty clay loam, 18 to 45 percent slopes-----	17,683	4.0
841G	Boone-Rock outcrop complex, 20 to 70 percent slopes-----	3,797	0.9
861E	Yellowriver silt loam, 9 to 18 percent slopes-----	722	0.2
861F	Yellowriver silt loam, 18 to 25 percent slopes-----	192	*
903C	Frankville silt loam, 5 to 9 percent slopes-----	482	0.1
903D2	Frankville silt loam, 9 to 14 percent slopes, moderately eroded-----	1,043	0.2
903E2	Frankville silt loam, 14 to 18 percent slopes, moderately eroded-----	838	0.2
912F	Paintcreek silt loam, 18 to 30 percent slopes-----	517	0.1
914B	Winneshiek loam, 2 to 5 percent slopes-----	10,052	2.3
914C	Winneshiek loam, 5 to 9 percent slopes-----	2,738	0.6
914D	Winneshiek loam, 9 to 14 percent slopes-----	516	0.1
914E	Winneshiek loam, 14 to 18 percent slopes-----	357	*
926	Canoe silt loam, 0 to 2 percent slopes, rarely flooded-----	286	*
965C2	Dubuque-Fayette complex, 5 to 9 percent slopes, moderately eroded-----	1,011	0.2
965D2	Dubuque-Fayette complex, 9 to 14 percent slopes, moderately eroded-----	4,513	1.0
965E2	Dubuque-Fayette complex, 14 to 18 percent slopes, moderately eroded-----	8,645	2.0
965G	Dubuque-Fayette complex, 18 to 30 percent slopes-----	1,380	0.3
978	Festina silt loam, 0 to 2 percent slopes-----	269	*
978B	Festina silt loam, 2 to 5 percent slopes-----	308	*
1026	Bearpen silt loam, 0 to 2 percent slopes, rarely flooded-----	176	*
1084	Bearpen-Lawson complex, 0 to 2 percent slopes, rarely flooded, overwash--	888	0.2
1152	Marshan loam, 0 to 2 percent slopes, rarely flooded-----	1,573	0.4

See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
1489B	Lawson-Ossian complex, 0 to 4 percent slopes-----	9,788	2.2
1763E2	Fayette-Exette complex, 14 to 18 percent slopes, moderately eroded-----	452	0.1
1763F2	Fayette-Exette complex, 18 to 25 percent slopes, moderately eroded-----	864	0.2
1936	Udifluents-Spillville complex, channeled, 0 to 2 percent slopes, frequently flooded-----	2,791	0.6
2486	Spillville, occasionally flooded-Waukee complex, 0 to 2 percent slopes---	1,892	0.4
2551	Calamine-Jacwin complex, 0 to 3 percent slopes-----	493	0.1
2671	Ion-Eitzen complex, 0 to 2 percent slopes, occasionally flooded-----	10,180	2.3
5010	Pits, sand and gravel-----	60	*
5030	Pits, limestone quarries-----	345	*
5040	Udorthents, loamy-----	112	*
5080	Udorthents, sanitary landfill-----	67	*
AW	Animal waste lagoon-----	6	*
SL	Sewage lagoon-----	25	*
W	Water-----	1,725	0.4
	Total-----	441,500	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 is described, and interpretations 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 management concerns affecting the use of the detailed soil map units in the county for crops are shown in the table “Cropland Management Considerations” at the end of this section. The main concerns in managing nonirrigated cropland 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.

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.

Some of the considerations shown in the table cannot be easily overcome. These are channels, flooding, gullies, and ponding.

Additional considerations are as follows:

Lime content, limited available water capacity, limited content of organic matter, potential poor tilth and compaction, and restricted permeability.—These limitations can be minimized by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

Potential for ground-water contamination.—The proper use of nutrients and pesticides can reduce the risk of ground-water contamination.

Potential for surface-water contamination.—The risk of surface-water contamination can be reduced by the proper use of nutrients and pesticides and by conservation farming practices that reduce the runoff rate.

Surface crusting.—This limitation retards seedling development after periods of heavy rainfall.

Surface rock fragments.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Surface stones.—Stones or boulders on or near the surface can hinder normal tillage unless they are removed.

Salt content.—In areas where this is a limitation, only salt-tolerant crops should be grown.

On irrigated soils the main management concerns are efficient water use, nutrient management, control of erosion, pest and weed control, and timely planting and harvesting for a successful crop. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can increase wetness and soil salinity.

Explanation of Criteria

Acid soil.—The pH is less than 6.1.

Channeled.—The word “channeled” is included in the map unit name.

Dense layer.—The bulk density is 1.80 g/cc or greater within the soil profile.

Depth to rock.—The depth to bedrock is less than 40 inches.

Eroded.—The word “eroded” is included in the map unit name.

Excessive permeability.—Saturated hydraulic conductivity is 42 micrometers per second or more within the soil profile.

Flooding.—Flooding is occasional, frequent, or very frequent.

Gullied.—The word “gullied” is included in the map unit name.

High content of organic matter.—The surface layer has more than 20 percent organic matter.

Lime content.—The pH is 7.4 or more in the surface layer, or the wind erodibility group is 4L.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Limited content of organic matter.—The content of organic matter is 2 percent or less in the surface layer.

Ponding.—Ponding duration is assigned to the map unit component. Water is above the surface.

Potential poor tilth and compaction.—The content of clay is 27 percent or more in the surface layer.

Potential for ground-water contamination (by nutrients or pesticides).—The depth to a seasonal high water table is 4 feet or less, the saturated hydraulic conductivity of any layer is more than 42 micrometers per second, or the depth to bedrock is less than 60 inches.

Potential for surface-water contamination (by nutrients or pesticides).—The map unit component is occasionally, frequently, or very frequently flooded, is subject to ponding, is assigned to hydrologic group C or D and has a slope of more than 2 percent, is assigned to hydrologic group A and has a slope of more than 6 percent, or is assigned to hydrologic group B, has a slope of 3 percent or more, and has a K factor of more than 0.17.

Previously eroded.—The word “eroded” is included in the map unit name.

Restricted permeability.—Saturated hydraulic conductivity is less than 0.42 micrometer per second within the soil profile.

Salt content.—The electrical conductivity is 4 or more in the surface layer or 8 or more within a depth of 30 inches.

Slope (equipment limitation).—The slope is more than 15 percent.

Surface crusting.—The content of clay is 27 percent or more and the content of organic matter is 2 percent or less in the surface layer.

Surface rock fragments (equipment limitation).—The terms describing the texture of the surface layer include any rock fragment modifier, except for gravelly, channery, stony, very stony, extremely stony, bouldery, very bouldery, and extremely bouldery.

Surface stones (equipment limitation).—The word “stony” or “bouldery” is included in the description of the surface layer, or 0.01 to 0.1 percent of the surface is covered by stones or boulders.

Water erosion.—Either the slope is 6 percent or more, or the slope is more than 3 percent and less than 6 percent and the surface layer is not sandy.

Water table.—A water table is within 2.5 feet of the surface.

Wind erosion.—The wind erodibility group is 1, 2, 3, or 4L.

Hydrologic groups are described under the heading “Water Features.” Erosion factors (e.g., K factor) and wind erodibility groups are described under the heading “Physical Properties.”

Cropland Management Considerations

(See text for a description of the considerations listed in this table)

Map symbol and soil name	Pct. of map unit	Cropland management considerations
27B: Terril-----	75	Potential for ground-water contamination Potential for surface-water contamination Water erosion
41: Sparta-----	100	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
41B: Sparta-----	100	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
41D: Sparta-----	100	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
63B: Chelsea-----	85	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
63D: Chelsea-----	75	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
84: Clyde-----	75	Dense layer Potential for ground-water contamination Water table
85: Eitzen, occasionally flooded	75	Acid soil Flooding Potential for ground-water contamination Potential for surface-water contamination
98: Huntsville, occasionally flooded-----	100	Flooding Potential for surface-water contamination

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
98B: Huntsville, occasionally flooded-----	100	Flooding Potential for surface-water contamination Water erosion
109B: Backbone-----	80	Acid soil Depth to rock Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
109C: Backbone-----	75	Acid soil Depth to rock Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
109D: Backbone-----	80	Acid soil Depth to rock Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
135: Coland, occasionally flooded	90	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water table
136B: Ankeny-----	100	Excessive permeability Potential for ground-water contamination Water erosion Wind erosion
162B: Downs-----	100	Potential for surface-water contamination Water erosion
162C: Downs-----	95	Potential for surface-water contamination Water erosion
162D: Downs-----	80	Potential for surface-water contamination Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
162E2: Downs, moderately eroded-----	80	Slope Potential for surface-water contamination Previously eroded Water erosion
163B: Fayette-----	100	Potential for surface-water contamination Water erosion
163C2: Fayette, moderately eroded---	90	Potential for surface-water contamination Previously eroded Water erosion
163D2: Fayette, moderately eroded---	80	Potential for surface-water contamination Previously eroded Water erosion
163E2: Fayette, moderately eroded---	75	Slope Potential for surface-water contamination Previously eroded Water erosion
163F: Fayette-----	80	Slope Potential for surface-water contamination Water erosion
163G: Fayette-----	95	Slope Potential for surface-water contamination Water erosion
175B: Dickinson-----	85	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
177C2: Saude, moderately eroded-----	90	Acid soil Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
178: Waukee-----	85	Acid soil Excessive permeability Potential for ground-water contamination
178B: Waukee-----	75	Acid soil Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
196: Volney, occasionally flooded	95	Flooding Excessive permeability Lime content Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Wind erosion
196+: Volney, occasionally flooded, overwash-----	95	Flooding Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination
196B: Volney, rarely flooded-----	95	Excessive permeability Lime content Limited available water capacity Potential for ground-water contamination Wind erosion
198B: Floyd-----	90	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
221: Klossner-----	75	High organic matter content Potential for ground-water contamination Water table Wind erosion
221+: Klossner, occasionally flooded, overwash-----	95	Flooding High organic matter content Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
235: Turlin, rarely flooded-----	55	Excessive permeability Potential for ground-water contamination Water table
Coland, occasionally flooded	25	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water table
241B: Lilah-----	70	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
241B: Dickinson-----	20	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
241C: Lilah-----	60	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Dickinson-----	25	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
241D: Lilah-----	60	Acid soil Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Dickinson-----	40	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
285B: Burkhardt-----	75	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
285F: Burkhardt-----	75	Slope Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
291B: Atterberry-----	100	Potential for ground-water contamination Water erosion Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
302B: Coggon-----	80	Acid soil Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
302C: Coggon-----	75	Acid soil Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
302C2: Coggon, moderately eroded----	80	Acid soil Dense layer Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Water table
320: Arenzville, occasionally flooded-----	100	Flooding Potential for ground-water contamination Potential for surface-water contamination
391B: Clyde-----	45	Dense layer Potential for ground-water contamination Water erosion Water table
Floyd-----	40	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
394B: Ostrander-----	80	Dense layer Potential for surface-water contamination Water erosion
394C: Ostrander-----	85	Dense layer Potential for surface-water contamination Water erosion
395B: Marquis-----	100	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
444: Jacwin-----	80	Depth to rock Potential for ground-water contamination Restricted permeability Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
444B: Jacwin-----	75	Depth to rock Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Water table
444C: Jacwin-----	75	Depth to rock Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Water table
468B: Dunkerton-----	70	Dense layer Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table Wind erosion
471: Oran-----	80	Dense layer Potential for ground-water contamination Water table
471B: Oran-----	90	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
480B: Orwood-----	100	Potential for surface-water contamination Water erosion
480C2: Orwood, moderately eroded----	100	Potential for surface-water contamination Previously eroded Water erosion
480D2: Orwood, moderately eroded----	85	Potential for surface-water contamination Previously eroded Water erosion
480E2: Orwood, moderately eroded----	85	Slope Potential for surface-water contamination Previously eroded Water erosion
480E3: Orwood, severely eroded-----	90	Slope Limited organic matter content Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
480F2: Orwood, moderately eroded----	85	Slope Potential for surface-water contamination Previously eroded Water erosion
482B: Racine-----	80	Acid soil Dense layer Potential for surface-water contamination Water erosion
484: Lawson, occasionally flooded	90	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
485: Spillville, occasionally flooded-----	100	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
487B: Otter, frequently flooded----	50	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Worthen-----	40	Potential for surface-water contamination Water erosion
489: Ossian, occasionally flooded	95	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
491D2: Renova, moderately eroded----	80	Acid soil Dense layer Potential for surface-water contamination Previously eroded Water erosion
491E2: Renova, moderately eroded----	85	Acid soil Slope Dense layer Potential for surface-water contamination Previously eroded Water erosion
499D: Nordness-----	75	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
499G: Nordness-----	75	Slope Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
512B: Marlean-----	90	Potential for ground-water contamination Potential for surface-water contamination Water erosion
512C: Marlean-----	75	Potential for ground-water contamination Potential for surface-water contamination Water erosion
512C2: Marlean, moderately eroded---	75	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
512D2: Marlean, moderately eroded---	75	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
512E2: Marlean, moderately eroded---	80	Slope Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
582B: Kasson-----	85	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
582C: Kasson-----	95	Dense layer Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
582C2: Kasson, moderately eroded---	85	Dense layer Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Water table
626: Hayfield-----	75	Acid soil Excessive permeability Potential for ground-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
762B: Downs-----	55	Potential for surface-water contamination Water erosion
Tama-----	45	Potential for surface-water contamination Water erosion
762C: Downs-----	50	Potential for surface-water contamination Water erosion
Tama-----	50	Potential for surface-water contamination Water erosion
775B: Billett-----	100	Excessive permeability Limited organic matter content Potential for ground-water contamination Water erosion Wind erosion
775C: Billett-----	90	Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
775D: Billett-----	90	Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
782B: Donnan-----	90	Acid soil Dense layer Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Water table
793: Bertrand-----	85	Excessive permeability Potential for ground-water contamination
793B: Bertrand-----	100	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion
806B: Whalan-----	80	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
806C2: Whalan, moderately eroded----	80	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion
806D: Whalan-----	80	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion
813B: Atkinson-----	55	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
814: Rockton-----	95	Depth to rock Limited available water capacity Potential for ground-water contamination
814B: Rockton-----	85	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
814C: Rockton-----	85	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
814D: Rockton-----	75	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
837D2: Village, moderately eroded---	75	Acid soil Potential for surface-water contamination Previously eroded Water erosion
837E2: Village, moderately eroded---	80	Acid soil Slope Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
838D: Allamakee-----	90	Acid soil Potential for surface-water contamination Water erosion
838E: Allamakee-----	90	Acid soil Slope Potential for surface-water contamination Water erosion
840E: Lacrescent-----	75	Slope Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Surface rock fragments
840G: Lacrescent-----	75	Slope Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Surface rock fragments Water erosion
841G: Boone-----	65	Slope Depth to rock Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Water erosion Wind erosion
Rock outcrop-----	20	Not applicable
861E: Yellowriver-----	95	Slope Potential for surface-water contamination Water erosion
861F: Yellowriver-----	95	Slope Potential for surface-water contamination Water erosion
903C: Frankville-----	75	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
903D2: Frankville, moderately eroded	75	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
903E2: Frankville, moderately eroded	75	Slope Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
912F: Paintcreek-----	95	Acid soil Slope Potential for surface-water contamination Water erosion
914B: Winneshiek-----	85	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
914C: Winneshiek-----	75	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
914D: Winneshiek-----	80	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
914E: Winneshiek-----	80	Slope Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
926: Canoe, rarely flooded-----	95	Acid soil Potential for ground-water contamination Water table
965C2: Dubuque, moderately eroded---	55	Acid soil Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
Fayette, moderately eroded---	40	Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
965D2: Dubuque, moderately eroded---	50	Acid soil Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
Fayette, moderately eroded---	30	Potential for surface-water contamination Previously eroded Water erosion
965E2: Dubuque, moderately eroded---	50	Acid soil Slope Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
Fayette, moderately eroded---	30	Slope Potential for surface-water contamination Previously eroded Water erosion
965G: Dubuque-----	55	Acid soil Slope Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion
Fayette-----	40	Slope Potential for surface-water contamination Water erosion
978: Festina-----	100	Acid soil Potential for ground-water contamination
978B: Festina-----	100	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
1026: Bearpen, rarely flooded-----	80	Potential for ground-water contamination Water table
1084: Bearpen, rarely flooded, overwash-----	50	Potential for ground-water contamination Water table
Lawson, rarely flooded, overwash-----	40	Potential for ground-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
1152: Marshan, rarely flooded-----	75	Potential for ground-water contamination Water table
1489B: Lawson, frequently flooded---	55	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Ossian, frequently flooded---	40	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
1763E2: Fayette, moderately eroded---	50	Slope Potential for surface-water contamination Previously eroded Water erosion
Exette, moderately eroded----	45	Slope Potential for surface-water contamination Previously eroded Water erosion
1763F2: Fayette, moderately eroded---	50	Slope Potential for surface-water contamination Previously eroded Water erosion
Exette, moderately eroded----	45	Slope Potential for surface-water contamination Previously eroded Water erosion
1936: Udifluvents, channeled, frequently flooded-----	50	Flooding Channeled Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Spillville, channeled, frequently flooded-----	35	Flooding Channeled Potential for ground-water contamination Potential for surface-water contamination Water table
2486: Spillville, occasionally flooded-----	50	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
2486: Waukee-----	35	Acid soil Excessive permeability Potential for ground-water contamination
2551: Calamine-----	50	Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
Jacwin-----	35	Depth to rock Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
2671: Ion, occasionally flooded----	65	Flooding Lime content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Eitzen, occasionally flooded	35	Acid soil Flooding Potential for ground-water contamination Potential for surface-water contamination
5010: Pits, sand and gravel-----	100	Not applicable
5030: Pits, limestone quarries----	100	Not applicable
5040, 5080: Udorthents-----	100	Onsite investigation required
AW: Animal waste lagoon-----	100	Not applicable
SL: Sewage lagoon-----	100	Not applicable
W: Water-----	100	Not applicable

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 determined through recent research conducted by Iowa State University. They are based on a high level of management and are for nonirrigated areas. See text for additional information. 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	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
27B----- Terril	75	2e	87	182	49	88
41----- Sparta	100	4s	40	99	27	48
41B----- Sparta	100	4s	25	95	26	46
41D----- Sparta	100	6s	15	---	---	---
63B----- Chelsea	85	4s	36	89	24	43
63D----- Chelsea	75	6s	21	---	---	---
84----- Clyde	75	2w	73	175	43	84
85----- Eitzen, occasionally flooded	75	2w	88	176	48	86
98----- Huntsville, occasionally flooded	100	2w	95	200	54	97
98B----- Huntsville, occasionally flooded	100	2e	90	197	53	95
109B----- Backbone	80	4s	25	70	18	33
109C----- Backbone	75	4s	10	75	20	36
109D----- Backbone	80	6s	5	---	---	---
135----- Coland, occasionally flooded	90	2w	78	170	46	83
136B----- Ankeny	100	3e	65	142	39	69
162B----- Downs	100	2e	88	195	53	95
162C----- Downs	95	3e	73	189	51	92

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
162D----- Downs	80	3e	63	177	47	85
162E2----- Downs, moderately eroded	80	4e	51	154	41	75
163B----- Fayette	100	2e	83	183	50	89
163C2----- Fayette, moderately eroded	90	3e	66	172	46	83
163D2----- Fayette, moderately eroded	80	3e	56	159	43	77
163E2----- Fayette, moderately eroded	75	4e	46	137	37	66
163F----- Fayette	80	6e	28	---	---	---
163G----- Fayette	95	7e	16	---	---	---
175B----- Dickinson	85	3s	54	123	33	59
177C2----- Saude, moderately eroded	90	3s	37	116	31	56
178----- Waukee	85	2s	79	161	43	78
178B----- Waukee	75	2e	74	149	40	72
196----- Volney, occasionally flooded	95	4s	57	67	18	32
196+----- Volney, occasionally flooded, overwash	95	3s	60	71	19	34
196B----- Volney, rarely flooded	95	4s	52	63	17	30
198B----- Floyd	90	2w	78	179	44	87
221----- Klossner	75	3w	25	143	39	69
221+----- Klossner, occasionally flooded, overwash	95	3w	25	148	40	72

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
235----- Turlin, rarely flooded-- Coland, occasionally flooded-----	55 25	2w 2w	82	173	47	84
241B----- Lilah----- Dickinson-----	70 20	3s 3s	35	87	23	41
241C----- Lilah----- Dickinson-----	60 25	4s 3s	20	90	24	43
241D----- Lilah----- Dickinson-----	60 40	4s 3s	10	75	20	36
285B----- Burkhardt	75	3s	25	85	22	41
285F----- Burkhardt	75	6s	5	---	---	---
291B----- Atterberry	100	2e	93	185	50	90
302B----- Coggon	80	2e	73	158	39	76
302C----- Coggon	75	3e	58	147	36	71
302C2----- Coggon, moderately eroded	80	3e	56	136	34	66
320----- Arenzville, occasionally flooded	100	2w	83	167	45	81
391B----- Clyde----- Floyd-----	45 40	2w 2w	73	168	42	82
394B----- Ostrander	80	2e	83	183	45	88
394C----- Ostrander	85	3e	68	179	44	86
395B----- Marquis	100	2e	87	194	53	94
444----- Jacwin	80	2w	63	140	38	68
444B----- Jacwin	75	2e	58	145	38	71
444C----- Jacwin	75	3e	38	133	35	64

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
468B----- Dunkerton	70	2e	60	184	49	89
471----- Oran	80	1	83	179	44	87
471B----- Oran	90	2e	78	176	43	85
480B----- Orwood	100	2e	78	185	50	90
480C2----- Orwood, moderately eroded	100	3e	62	177	48	86
480D2----- Orwood, moderately eroded	85	3e	54	164	44	79
480E2----- Orwood, moderately eroded	85	4e	42	139	37	67
480E3----- Orwood, severely eroded	90	6e	37	---	---	---
480F2----- Orwood, moderately eroded	85	6e	20	---	---	---
482B----- Racine	80	2e	78	165	41	80
484----- Lawson, occasionally flooded	90	2w	90	194	52	94
485----- Spillville, occasionally flooded	100	2w	92	193	52	94
487B----- Otter, frequently flooded----- Worthen-----	50 40	2w 2e	68	180	48	87
489----- Ossian, occasionally flooded	95	2w	78	171	46	83
491D2----- Renova, moderately eroded	80	3e	48	131	32	64
491E2----- Renova, moderately eroded	85	4e	38	121	29	58
499D----- Nordness	75	6s	5	---	---	---

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
499G----- Nordness	75	7s	5	---	---	---
512B----- Marlean	90	3e	45	101	27	49
512C----- Marlean	75	4e	30	100	25	48
512C2----- Marlean, moderately eroded	75	4e	20	95	24	46
512D2----- Marlean, moderately eroded	75	6e	5	---	---	---
512E2----- Marlean, moderately eroded	80	7e	5	---	---	---
582B----- Kasson	85	2e	78	172	42	83
582C----- Kasson	95	3e	64	170	41	82
582C2----- Kasson, moderately eroded	85	3e	62	154	38	74
626----- Hayfield	75	2s	65	149	40	72
762B----- Downs----- Tama-----	55 45	2e 2e	90	199	54	97
762C----- Downs----- Tama-----	50 50	3e 3e	75	194	52	94
775B----- Billett	100	2e	50	122	33	59
775C----- Billett	90	3e	35	116	31	56
775D----- Billett	90	3e	25	105	28	51
782B----- Donnan	90	2e	57	120	32	58
793----- Bertrand	85	1	83	171	46	83
793B----- Bertrand	100	2e	78	174	47	85
806B----- Whalan	80	2e	48	111	29	54

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
806C2----- Whalan, moderately eroded	80	3e	23	113	30	55
806D----- Whalan	80	4e	13	109	29	53
813B----- Atkinson	55	2e	70	169	41	82
814----- Rockton	95	2e	62	154	38	74
814B----- Rockton	85	2e	57	146	36	71
814C----- Rockton	85	3e	38	139	34	67
814D----- Rockton	75	4e	13	129	32	62
837D2----- Village, moderately eroded	75	3e	28	126	34	61
837E2----- Village, moderately eroded	80	4e	13	105	28	50
838D----- Allamakee	90	3e	38	138	37	67
838E----- Allamakee	90	4e	23	123	33	59
840E----- Lacrescent	75	6e	5	---	---	---
840G----- Lacrescent	75	7e	5	---	---	---
841G----- Boone----- Rock outcrop-----	65 20	7s 8	5	---	---	---
861E----- Yellowriver	95	4e	50	141	38	68
861F----- Yellowriver	95	6e	30	---	---	---
903C----- Frankville	75	3e	39	120	32	58
903D2----- Frankville, moderately eroded	75	4e	24	113	30	55
903E2----- Frankville, moderately eroded	75	4e	5	102	27	49

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
912F----- Paintcreek	95	7e	5	---	---	---
914B----- Winneshiek	85	2e	53	113	28	54
914C----- Winneshiek	75	3e	33	105	26	51
914D----- Winneshiek	80	4e	18	99	25	48
914E----- Winneshiek	80	6e	5	102	25	50
926----- Canoe, rarely flooded	95	1	90	189	51	92
965C2----- Dubuque, moderately eroded----- Fayette, moderately eroded-----	55 40	3e 3e	45	134	36	65
965D2----- Dubuque, moderately eroded----- Fayette, moderately eroded-----	50 30	4e 3e	30	109	29	52
965E2----- Dubuque, moderately eroded----- Fayette, moderately eroded-----	50 30	4e 4e	20	96	25	46
965G----- Dubuque----- Fayette-----	55 40	7e 7e	8	---	---	---
978----- Festina	100	1	88	189	51	92
978B----- Festina	100	2e	83	185	50	90
1026----- Bearpen, rarely flooded	80	2w	90	203	55	99
1084----- Bearpen, rarely flooded, overwash----- Lawson, rarely flooded, overwash-----	50 40	2w 2w	90	198	54	96
1152----- Marshan, rarely flooded	75	2w	66	149	40	72
1489B----- Lawson, frequently flooded----- Ossian, frequently flooded-----	55 40	2w 2w	82	176	47	85

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
1763E2----- Fayette, moderately eroded----- Exette, moderately eroded-----	50 45	4e 4e	45	138	37	66
1763F2----- Fayette, moderately eroded----- Exette, moderately eroded-----	50 45	6e 6e	27	---	---	---
1936----- Udifluents, channeled, frequently flooded----- Spillville, channeled, frequently flooded-----	50 35	5w 5w	25	---	---	---
2486----- Spillville, occasionally flooded----- Waukee-----	50 35	2w 2s	86	175	47	85
2551----- Calamine----- Jacwin-----	50 35	3w 2w	58	136	37	66
2671----- Ion, occasionally flooded----- Eitzen, occasionally flooded-----	65 35	2w 2w	88	178	48	86
5010. Pits, sand and gravel						
5030. Pits, limestone quarries						
5040, 5080. Udorthents						
AW. Animal waste lagoon						
SL. Sewage lagoon						
W. Water						

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	Pct. of map unit	Land capability	Brome-grass-	Smooth	Kentucky	Brome-grass-
			alfalfa hay	brome-grass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
27B----- Terril	75	2e	6.2	6.1	3.7	10.4
41----- Sparta	100	4s	3.4	3.3	2.0	5.7
41B----- Sparta	100	4s	3.2	3.2	1.9	5.3
41D----- Sparta	100	6s	2.8	2.7	1.6	4.7
63B----- Chelsea	85	4s	3.1	3.0	1.8	5.1
63D----- Chelsea	75	6s	2.7	2.6	1.6	4.6
84----- Clyde	75	2w	4.5	5.8	3.5	7.5
85----- Eitzen, occasionally flooded	75	2w	5.9	5.9	3.6	9.9
98----- Huntsville, occasionally flooded	100	2w	6.8	6.6	4.0	11.4
98B----- Huntsville, occasionally flooded	100	2e	6.7	6.5	3.9	11.2
109B----- Backbone	80	4s	2.4	2.3	1.4	4.0
109C----- Backbone	75	4s	2.6	2.5	1.5	4.3
109D----- Backbone	80	6s	2.0	1.9	1.1	3.3
135----- Coland, occasionally flooded	90	2w	4.3	5.7	3.4	7.2
136B----- Ankeny	100	3e	4.8	4.7	2.8	8.0
162B----- Downs	100	2e	6.6	6.5	3.9	11.0
162C----- Downs	95	3e	6.4	6.3	3.8	10.7

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
162D----- Downs	80	3e	6.0	5.9	3.5	10.0
162E2----- Downs, moderately eroded	80	4e	5.3	5.1	3.1	8.8
163B----- Fayette	100	2e	6.2	6.1	3.7	10.4
163C2----- Fayette, moderately eroded	90	3e	5.9	5.7	3.4	9.9
163D2----- Fayette, moderately eroded	80	3e	5.4	5.3	3.1	9.0
163E2----- Fayette, moderately eroded	75	4e	4.7	4.6	2.7	7.8
163F----- Fayette	80	6e	4.5	4.4	2.6	7.4
163G----- Fayette	95	7e	---	---	2.3	---
175B----- Dickinson	85	3s	4.2	4.1	2.5	7.1
177C2----- Saude, moderately eroded	90	3s	4.0	3.9	2.3	6.7
178----- Waukee	85	2s	5.4	5.4	3.2	9.1
178B----- Waukee	75	2e	5.1	5.0	3.0	8.5
196----- Volney, occasionally flooded	95	4s	2.3	2.3	1.4	3.8
196+----- Volney, occasionally flooded, overwash	95	3s	2.4	2.4	1.4	4.0
196B----- Volney, rarely flooded	95	4s	2.2	2.1	1.2	3.6
198B----- Floyd	90	2w	5.6	6.0	3.6	9.4
221----- Klossner	75	3w	3.5	4.8	2.8	5.9
221+----- Klossner, occasionally flooded, overwash	95	3w	3.6	4.9	2.9	6.0

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
235----- Turlin, rarely flooded-- Coland, occasionally flooded-----	55 25	2w 2w	5.3	5.8	3.5	8.9
241B----- Lilah----- Dickinson-----	70 20	3s 3s	3.0	2.9	1.7	5.0
241C----- Lilah----- Dickinson-----	60 25	4s 3s	3.1	3.0	1.8	5.1
241D----- Lilah----- Dickinson-----	60 40	4s 3s	2.6	2.5	1.5	4.3
285B----- Burkhardt	75	3s	2.9	2.8	1.7	4.9
285F----- Burkhardt	75	6s	1.8	1.8	1.1	3.1
291B----- Atterberry	100	2e	6.0	6.2	3.7	10.0
302B----- Coggon	80	2e	5.4	5.2	3.2	9.0
302C----- Coggon	75	3e	4.9	4.9	2.9	8.3
302C2----- Coggon, moderately eroded	80	3e	4.7	4.5	2.7	7.8
320----- Arenzville, occasionally flooded	100	2w	5.7	5.5	3.3	9.5
391B----- Clyde----- Floyd-----	45 40	2w 2w	4.8	5.6	3.3	8.0
394B----- Ostrander	80	2e	6.3	6.1	3.7	10.5
394C----- Ostrander	85	3e	6.1	6.0	3.6	10.2
395B----- Marquis	100	2e	6.6	6.4	3.8	11.0
444----- Jacwin	80	2w	4.6	4.7	2.8	7.6
444B----- Jacwin	75	2e	4.7	4.9	2.9	7.9

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
444C----- Jacwin	75	3e	4.4	4.4	2.7	7.3
468B----- Dunkerton	70	2e	6.2	6.1	3.7	10.4
471----- Oran	80	1	5.6	6.0	3.6	9.4
471B----- Oran	90	2e	5.6	5.9	3.5	9.3
480B----- Orwood	100	2e	6.3	6.2	3.7	10.5
480C2----- Orwood, moderately eroded	100	3e	6.0	5.9	3.5	10.0
480D2----- Orwood, moderately eroded	85	3e	5.6	5.5	3.3	9.3
480E2----- Orwood, moderately eroded	85	4e	4.7	4.6	2.8	7.9
480E3----- Orwood, severely eroded	90	6e	4.5	4.4	2.7	7.5
480F2----- Orwood, moderately eroded	85	6e	4.5	4.4	2.6	7.5
482B----- Racine	80	2e	5.6	5.5	3.3	9.4
484----- Lawson, occasionally flooded	90	2w	6.3	6.4	3.8	10.5
485----- Spillville, occasionally flooded	100	2w	6.2	6.4	3.8	10.4
487B----- Otter, frequently flooded-----	50	2w	5.3	6.0	3.6	8.8
Worthen-----	40	2e				
489----- Ossian, occasionally flooded	95	2w	4.2	5.7	3.4	6.9
491D2----- Renova, moderately eroded	80	3e	4.5	4.4	2.7	7.5

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Brome-grass-	Smooth	Kentucky	Brome-grass-
			alfalfa hay	brome-grass	blue-grass	alfalfa
			Tons	AUM*	AUM*	AUM*
491E2----- Renova, moderately eroded	85	4e	4.2	4.1	2.5	7.0
499D----- Nordness	75	6s	2.1	2.1	1.3	3.6
499G----- Nordness	75	7s	---	---	0.4	---
512B----- Marlean	90	3e	3.5	3.4	2.0	5.8
512C----- Marlean	75	4e	3.4	3.3	2.0	5.6
512C2----- Marlean, moderately eroded	75	4e	3.3	3.2	1.9	5.5
512D2----- Marlean, moderately eroded	75	6e	2.6	2.6	1.6	4.4
512E2----- Marlean, moderately eroded	80	7e	2.2	2.2	1.4	3.7
582B----- Kasson	85	2e	5.9	5.7	3.4	9.8
582C----- Kasson	95	3e	5.8	5.7	3.4	9.7
582C2----- Kasson, moderately eroded	85	3e	5.2	5.1	3.1	8.7
626----- Hayfield	75	2s	4.7	5.0	2.9	7.9
762B----- Downs----- Tama-----	55 45	2e 2e	6.8	6.6	4.0	11.3
762C----- Downs----- Tama-----	50 50	3e 3e	6.6	6.5	3.9	11.1
775B----- Billett	100	2e	4.2	4.1	2.5	7.0
775C----- Billett	90	3e	3.9	3.9	2.3	6.5
775D----- Billett	90	3e	3.6	3.5	2.1	6.0
782B----- Donnan	90	2e	3.9	4.0	2.4	6.6

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
793----- Bertrand	85	1	5.8	5.7	3.4	9.6
793B----- Bertrand	100	2e	5.9	5.8	3.5	9.9
806B----- Whalan	80	2e	3.8	3.7	2.2	6.3
806C2----- Whalan, moderately eroded	80	3e	3.9	3.7	2.2	6.4
806D----- Whalan	80	4e	3.7	3.6	2.2	6.2
813B----- Atkinson	55	2e	5.8	5.6	3.4	9.7
814----- Rockton	95	2e	5.3	5.1	3.1	8.8
814B----- Rockton	85	2e	5.0	4.8	2.9	8.4
814C----- Rockton	85	3e	4.7	4.6	2.8	7.8
814D----- Rockton	75	4e	4.4	4.3	2.5	7.3
837D2----- Village, moderately eroded	75	3e	4.3	4.2	2.5	7.2
837E2----- Village, moderately eroded	80	4e	3.5	3.5	2.1	5.9
838D----- Allamakee	90	3e	4.7	4.6	2.8	7.9
838E----- Allamakee	90	4e	4.2	4.1	2.5	6.9
840E----- Lacrescent	75	6e	1.9	1.9	1.2	3.1
840G----- Lacrescent	75	7e	---	---	1.5	---
841G----- Boone----- Rock outcrop-----	65 20	7s 8	---	---	0.7	---
861E----- Yellowriver	95	4e	4.9	4.7	2.8	8.2
861F----- Yellowriver	95	6e	4.4	4.3	2.5	7.3

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
903C----- Frankville	75	3e	4.1	4.0	2.4	6.9
903D2----- Frankville, moderately eroded	75	4e	3.9	3.8	2.2	6.5
903E2----- Frankville, moderately eroded	75	4e	3.5	3.4	2.0	5.8
912F----- Paintcreek	95	7e	2.2	2.1	1.3	3.7
914B----- Winneshiek	85	2e	3.8	3.8	2.3	6.4
914C----- Winneshiek	75	3e	3.6	3.5	2.1	6.0
914D----- Winneshiek	80	4e	3.4	3.3	2.0	5.6
914E----- Winneshiek	80	6e	3.5	3.4	2.0	5.8
926----- Canoe, rarely flooded	95	1	6.1	6.3	3.8	10.3
965C2----- Dubuque, moderately eroded-----	55	3e	4.6	4.5	2.7	7.7
Fayette, moderately eroded-----	40	3e				
965D2----- Dubuque, moderately eroded-----	50	4e	3.7	3.6	2.1	6.2
Fayette, moderately eroded-----	30	3e				
965E2----- Dubuque, moderately eroded-----	50	4e	3.3	3.2	1.9	5.5
Fayette, moderately eroded-----	30	4e				
965G----- Dubuque-----	55	7e	---	---	1.8	---
Fayette-----	40	7e				
978----- Festina	100	1	6.4	6.3	3.8	10.7
978B----- Festina	100	2e	6.3	6.2	3.7	10.5
1026----- Bearpen, rarely flooded	80	2w	6.6	6.7	4.1	11.0

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
1084----- Bearpen, rarely flooded, overwash----- Lawson, rarely flooded, overwash-----	50 40	2w 2w	6.4	6.6	3.9	10.7
1152----- Marshan, rarely flooded	75	2w	3.9	4.9	2.9	6.5
1489B----- Lawson, frequently flooded----- Ossian, frequently flooded-----	55 40	2w 2w	5.1	5.9	3.5	8.6
1763E2----- Fayette, moderately eroded----- Exette, moderately eroded-----	50 45	4e 4e	4.7	4.6	2.8	7.9
1763F2----- Fayette, moderately eroded----- Exette, moderately eroded-----	50 45	6e 6e	4.2	4.1	2.5	7.0
1936----- Udifluents, channeled, frequently flooded----- Spillville, channeled, frequently flooded-----	50 35	5w 5w	---	---	1.9	---
2486----- Spillville, occasionally flooded----- Waukee-----	50 35	2w 2s	5.8	5.8	3.5	9.7
2551----- Calamine----- Jacwin-----	50 35	3w 2w	4.5	4.5	2.7	7.5
2671----- Ion, occasionally flooded----- Eitzen, occasionally flooded-----	65 35	2w 2w	6.1	5.9	3.6	10.1
5010. Pits, sand and gravel						
5030. Pits, limestone quarries						
5040, 5080. Udorthents						
AW. Animal waste lagoon						

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth	Kentucky	Bromegrass-
			alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
SL. Sewage lagoon						
W. Water						

* 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

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 qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. 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 parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in the table "Prime Farmland" at the end of this section. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the map unit name)

Map symbol	Map unit name
27B	Terril loam, 2 to 5 percent slopes
84	Clyde silt loam, 0 to 3 percent slopes (where drained)
85	Eitzen silt loam, 0 to 2 percent slopes, occasionally flooded
98	Huntsville silt loam, 0 to 2 percent slopes, occasionally flooded
98B	Huntsville silt loam, 2 to 5 percent slopes, occasionally flooded
135	Coland silty clay loam, 0 to 2 percent slopes, occasionally flooded (where drained)
136B	Ankeny fine sandy loam, 2 to 5 percent slopes
162B	Downs silt loam, 2 to 5 percent slopes
163B	Fayette silt loam, 2 to 5 percent slopes
175B	Dickinson sandy loam, 2 to 5 percent slopes
178	Waukee loam, 0 to 2 percent slopes
178B	Waukee loam, 2 to 5 percent slopes
198B	Floyd loam, 1 to 4 percent slopes
235	Turlin-Coland complex, 0 to 3 percent slopes, occasionally flooded (where drained)
291B	Atterberry silt loam, 1 to 4 percent slopes
302B	Coggon silt loam, 2 to 5 percent slopes
320	Arenzville silt loam, 0 to 2 percent slopes, occasionally flooded
391B	Clyde-Floyd complex, 1 to 4 percent slopes (where drained)
394B	Ostrander silt loam, 2 to 5 percent slopes
395B	Marquis loam, 2 to 5 percent slopes
444	Jacwin loam, 0 to 2 percent slopes
444B	Jacwin loam, 2 to 5 percent slopes
468B	Dunkerton sandy loam, 2 to 5 percent slopes
471	Oran loam, 0 to 2 percent slopes
471B	Oran loam, 2 to 5 percent slopes
480B	Orwood silt loam, 2 to 5 percent slopes
482B	Racine loam, 2 to 5 percent slopes
484	Lawson silt loam, 1 to 3 percent slopes, occasionally flooded
485	Spillville loam, 0 to 2 percent slopes, occasionally flooded
487B	Otter-Worthen complex, 1 to 4 percent slopes (where drained and either protected from flooding or not frequently flooded during the growing season)
489	Ossian silt loam, 0 to 3 percent slopes, occasionally flooded (where drained)
582B	Kasson loam, 2 to 5 percent slopes
626	Hayfield loam, 0 to 3 percent slopes
762B	Downs-Tama complex, 2 to 5 percent slopes
775B	Billett sandy loam, 2 to 5 percent slopes
782B	Donnan loam, 2 to 5 percent slopes
793	Bertrand silt loam, 0 to 2 percent slopes
793B	Bertrand silt loam, 2 to 5 percent slopes
813B	Atkinson loam, 2 to 5 percent slopes
814	Rockton loam, 0 to 2 percent slopes
814B	Rockton loam, 2 to 5 percent slopes
914B	Winneshiek loam, 2 to 5 percent slopes
926	Canoe silt loam, 0 to 2 percent slopes, rarely flooded
978	Festina silt loam, 0 to 2 percent slopes
978B	Festina silt loam, 2 to 5 percent slopes
1026	Bearpen silt loam, 0 to 2 percent slopes, rarely flooded
1084	Bearpen-Lawson complex, 0 to 2 percent slopes, rarely flooded, overwash
1152	Marshan loam, 0 to 2 percent slopes, rarely flooded (where drained)
1489B	Lawson-Ossian complex, 0 to 4 percent slopes (where drained and either protected from flooding or not frequently flooded during the growing season)
2486	Spillville, occasionally flooded-Waukee complex, 0 to 2 percent slopes
2551	Calamine-Jacwin complex, 0 to 3 percent slopes (where drained)
2671	Ion-Eitzen complex, 0 to 2 percent slopes, occasionally flooded

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

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
41: Sparta-----	100	Very limited Filtering capacity Leaching Too acid	1.00 0.45 0.02	Very limited Filtering capacity Too acid	1.00 0.07	Very limited Filtering capacity Too acid	1.00 0.07
41B: Sparta-----	100	Very limited Filtering capacity Leaching Too acid	1.00 0.45 0.02	Very limited Filtering capacity Too acid	1.00 0.07	Very limited Filtering capacity Too steep for surface application Too acid	1.00 0.08 0.07
41D: Sparta-----	100	Very limited Filtering capacity Leaching Slope	1.00 0.45 0.16	Very limited Filtering capacity Slope Too acid	1.00 0.16 0.07	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.40
63B: Chelsea-----	85	Very limited Filtering capacity Leaching Droughty	1.00 0.45 0.06	Very limited Filtering capacity Droughty	1.00 0.06	Very limited Filtering capacity Too steep for surface application Droughty	1.00 0.08 0.06
63D: Chelsea-----	75	Very limited Filtering capacity Leaching Slope	1.00 0.45 0.16	Very limited Filtering capacity Slope Droughty	1.00 0.16 0.06	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.40

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84: Clyde-----	75	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Leaching	1.00 1.00 0.70	Very limited Depth to saturated zone (Nov-Jul) Slow water movement	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Slow water movement	1.00 1.00
85: Eitzen, occasionally flooded-----	75	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
98: Huntsville, occasionally flooded-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
98B: Huntsville, occasionally flooded-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding Too steep for surface application	0.60 0.08
109B: Backbone-----	80	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.84 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.84 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.84 0.46
109C: Backbone-----	75	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.84 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.84 0.46	Very limited Slow water movement Too steep for surface application Droughty	1.00 0.92 0.84
109D: Backbone-----	80	Very limited Slow water movement Droughty Slope	1.00 0.84 0.63	Very limited Slow water movement Droughty Slope	1.00 0.84 0.63	Very limited Too steep for surface application Slow water movement Droughty	1.00 1.00 0.84

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
135: Coland, occasionally flooded-----	90	Very limited Depth to saturated zone (Nov-Jul) Leaching Flooding	1.00 0.70 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60
136B: Ankeny-----	100	Very limited Filtering capacity Leaching	1.00 0.45	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application	1.00 0.08
162B: Downs-----	100	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid	0.08 0.07
162C: Downs-----	95	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid Too steep for sprinkler application	0.92 0.07 0.02
162D: Downs-----	80	Somewhat limited Slope Too acid	0.63 0.02	Somewhat limited Slope Too acid	0.63 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 0.78 0.07
162E2: Downs, moderately eroded-----	80	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 1.00 0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163B: Fayette-----	100	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid	0.08 0.07
163C2: Fayette, moderately eroded-----	90	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid Too steep for sprinkler application	0.92 0.07 0.02
163D2: Fayette, moderately eroded-----	80	Somewhat limited Slope Too acid	0.63 0.02	Somewhat limited Slope Too acid	0.63 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 0.78 0.07
163E2: Fayette, moderately eroded-----	75	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 1.00 0.07
163F: Fayette-----	80	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for sprinkler application Too steep for surface application Too acid	1.00 1.00 0.07
163G: Fayette-----	95	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for sprinkler application Too steep for surface application Too acid	1.00 1.00 0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
175B: Dickinson-----	85	Very limited Filtering capacity Leaching Droughty	1.00 0.45 0.05	Very limited Filtering capacity Droughty	1.00 0.05	Very limited Filtering capacity Droughty	1.00 0.05
177C2: Saude, moderately eroded-----	90	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.02
178: Waukee-----	85	Very limited Filtering capacity Too acid	1.00 0.03	Very limited Filtering capacity Too acid	1.00 0.14	Very limited Filtering capacity Too acid	1.00 0.14
178B: Waukee-----	75	Very limited Filtering capacity Too acid	1.00 0.03	Very limited Filtering capacity Too acid	1.00 0.14	Very limited Filtering capacity Too acid	1.00 0.14
196: Volney, occasionally flooded-----	95	Very limited Filtering capacity Flooding Large stones on the surface	1.00 0.60 0.50	Very limited Filtering capacity Flooding Large stones on the surface	1.00 1.00 0.50	Very limited Filtering capacity Flooding Large stones on the surface	1.00 0.60 0.50
196+: Volney, occasionally flooded, overwash--	95	Very limited Filtering capacity Flooding Leaching	1.00 0.60 0.45	Very limited Filtering capacity Flooding	1.00 1.00	Very limited Filtering capacity Flooding	1.00 0.60
196B: Volney, rarely flooded-----	95	Very limited Filtering capacity Large stones on the surface Leaching	1.00 0.50 0.45	Very limited Filtering capacity Large stones on the surface Flooding	1.00 0.50 0.40	Very limited Filtering capacity Large stones on the surface	1.00 0.50

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
198B: Floyd-----	90	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01
221: Klossner-----	75	Very limited Depth to saturated zone (Nov-Jul) Leaching Too acid	1.00 0.90 0.01	Very limited Depth to saturated zone (Nov-Jul) Too acid	1.00 0.03	Very limited Depth to saturated zone (Nov-Jul) Too acid	1.00 0.03
221+: Klossner, occasionally flooded, overwash--	95	Very limited Depth to saturated zone (Nov-Jul) Leaching Flooding	1.00 0.90 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding Too acid	1.00 1.00 0.03	Very limited Depth to saturated zone (Nov-Jul) Flooding Too acid	1.00 0.60 0.03
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.40	Very limited Depth to saturated zone (Nov-Jul)	1.00
Coland, occasionally flooded-----	25	Very limited Depth to saturated zone (Nov-Jul) Leaching Flooding	1.00 0.70 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60
241B: Lilah-----	70	Very limited Filtering capacity Droughty Leaching	1.00 1.00 0.45	Very limited Filtering capacity Droughty Too acid	1.00 1.00 0.67	Very limited Filtering capacity Droughty Too acid	1.00 1.00 0.67
Dickinson-----	20	Very limited Filtering capacity Leaching Droughty	1.00 0.45 0.05	Very limited Filtering capacity Droughty	1.00 0.05	Very limited Filtering capacity Droughty	1.00 0.05

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
241C: Lilah-----	60	Very limited Filtering capacity Droughty Leaching	1.00 1.00 0.45	Very limited Filtering capacity Droughty Too acid	1.00 1.00 0.67	Very limited Filtering capacity Droughty Too steep for surface application	1.00 1.00 0.92
Dickinson-----	25	Very limited Filtering capacity Leaching Droughty	1.00 0.45 0.05	Very limited Filtering capacity Droughty	1.00 0.05	Very limited Filtering capacity Too steep for surface application Droughty	1.00 0.92 0.05
241D: Lilah-----	60	Very limited Filtering capacity Droughty Slope	1.00 1.00 0.63	Very limited Filtering capacity Droughty Too acid	1.00 1.00 0.67	Very limited Filtering capacity Too steep for surface application Droughty	1.00 1.00 1.00
Dickinson-----	40	Very limited Filtering capacity Slope Leaching	1.00 0.63 0.45	Very limited Filtering capacity Slope Droughty	1.00 0.63 0.05	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.78
285B: Burkhardt-----	75	Very limited Filtering capacity Droughty Leaching	1.00 0.91 0.45	Very limited Filtering capacity Droughty Too acid	1.00 0.91 0.07	Very limited Filtering capacity Droughty Too steep for surface application	1.00 0.91 0.08
285F: Burkhardt-----	75	Very limited Filtering capacity Slope Droughty	1.00 1.00 0.91	Very limited Filtering capacity Slope Droughty	1.00 1.00 0.91	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
291B: Atterberry-----	100	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul)	1.00
302B: Coggon-----	80	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Dense layer	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	Too acid	0.07	Too acid	0.07
302C: Coggon-----	75	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Dense layer	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	Too acid	0.07	Too steep for surface application	0.92
302C2: Coggon, moderately eroded-----	80	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Dense layer	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	Too acid	0.07	Too steep for surface application	0.92
320: Arenzville, occasionally flooded-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
391B: Clyde-----	45	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul)	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Leaching	0.70				

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
391B: Floyd-----	40	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01
394B: Ostrander-----	80	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement Too steep for surface application	1.00 0.08
394C: Ostrander-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement Too steep for surface application	1.00 0.68
395B: Marquis-----	100	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.08
444: Jacwin-----	80	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00
444B: Jacwin-----	75	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
444C: Jacwin-----	75	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.92
468B: Dunkerton-----	70	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Filtering capacity	1.00 1.00 0.01	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too steep for surface application	1.00 1.00 0.08
471: Oran-----	80	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Dense layer	1.00 1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too acid	1.00 1.00 0.07	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too acid	1.00 1.00 0.07
471B: Oran-----	90	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Dense layer	1.00 1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too acid	1.00 1.00 0.07	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too acid	1.00 1.00 0.07
480B: Orwood-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
480C2: Orwood, moderately eroded-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
480D2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78
480E2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
480F2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application Too steep for surface application	1.00 1.00
482B: Racine-----	80	Very limited Slow water movement Runoff Too acid	1.00 0.40 0.02	Very limited Slow water movement Too acid	1.00 0.07	Very limited Slow water movement Too acid	1.00 0.07
484: Lawson, occasionally flooded-----	90	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
485: Spillville, occasionally flooded-----	100	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60
487B: Otter, frequently flooded-----	50	Very limited Depth to saturated zone (Nov-Jul) Flooding Leaching	1.00 1.00 0.70	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00
Worthen-----	40	Not limited		Not limited		Not limited	
489: Ossian, occasionally flooded-----	95	Very limited Depth to saturated zone (Nov-Jul) Leaching Flooding	1.00 0.70 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60
491D2: Renova, moderately eroded-----	80	Very limited Slow water movement Dense layer Slope	1.00 1.00 0.63	Very limited Slow water movement Slope Too acid	1.00 0.63 0.14	Very limited Too steep for surface application Slow water movement Too steep for sprinkler application	1.00 1.00 0.78
491E2: Renova, moderately eroded-----	85	Very limited Slow water movement Slope Dense layer	1.00 1.00 1.00	Very limited Slow water movement Slope Too acid	1.00 1.00 0.14	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	1.00 1.00 1.00
499D: Nordness-----	75	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.63	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.63	Very limited Depth to bedrock Droughty Too steep for surface application	1.00 1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
499G: Nordness-----	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Too steep for	1.00
		Droughty	1.00	Droughty	1.00	surface	
		Slope	1.00	Slope	1.00	application	
						Depth to bedrock	1.00
						Droughty	1.00
512B: Marlean-----	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering	0.01	Filtering	0.01	Too steep for	0.08
		capacity		capacity		surface	
						application	
						Filtering	0.01
						capacity	
512C: Marlean-----	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering	0.01	Filtering	0.01	Too steep for	0.92
		capacity		capacity		surface	
						application	
						Too steep for	0.02
						sprinkler	
						application	
						Filtering	0.01
						capacity	
512C2: Marlean, moderately eroded-----	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering	0.01	Filtering	0.01	Too steep for	0.92
		capacity		capacity		surface	
						application	
						Too steep for	0.02
						sprinkler	
						application	
						Filtering	0.01
						capacity	
512D2: Marlean, moderately eroded-----	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Too steep for	1.00
		Filtering	0.01	Filtering	0.01	surface	
		capacity		capacity		application	
						Too steep for	0.40
						sprinkler	
						application	
						Filtering	0.01
						capacity	

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
512E2: Marlean, moderately eroded-----	80	Very limited Slope Filtering capacity	1.00 0.01	Very limited Slope Filtering capacity	1.00 0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 1.00 0.01
582B: Kasson-----	85	Very limited Slow water movement Dense layer Depth to saturated zone (Nov-Jul)	1.00 1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too acid	1.00 1.00 0.07	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.08
582C: Kasson-----	95	Very limited Slow water movement Dense layer Depth to saturated zone (Nov-Jul)	1.00 1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too acid	1.00 1.00 0.07	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.92
582C2: Kasson, moderately eroded-----	85	Very limited Slow water movement Dense layer Depth to saturated zone (Nov-Jul)	1.00 1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too acid	1.00 1.00 0.07	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.92
Hayfield-----	75	Very limited Filtering capacity Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Filtering capacity Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Filtering capacity Depth to saturated zone (Nov-Jul)	1.00 1.00
762B: Downs-----	55	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid	0.08 0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
762B: Tama-----	45	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid	0.08 0.07
762C: Downs-----	50	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid Too steep for sprinkler application	0.92 0.07 0.02
Tama-----	50	Somewhat limited Too acid	0.02	Somewhat limited Too acid	0.07	Somewhat limited Too steep for surface application Too acid Too steep for sprinkler application	0.92 0.07 0.02
775B: Billett-----	100	Very limited Filtering capacity Leaching Too acid	1.00 0.45 0.02	Very limited Filtering capacity Too acid	1.00 0.07	Very limited Filtering capacity Too steep for surface application Too acid	1.00 0.08 0.07
775C: Billett-----	90	Very limited Filtering capacity Leaching Too acid	1.00 0.45 0.02	Very limited Filtering capacity Too acid	1.00 0.07	Very limited Filtering capacity Too steep for surface application Too acid	1.00 0.92 0.07
775D: Billett-----	90	Very limited Filtering capacity Slope Leaching	1.00 0.63 0.45	Very limited Filtering capacity Slope Too acid	1.00 0.63 0.07	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
782B: Donnan-----	90	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too acid	1.00 1.00 0.07	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	1.00 1.00 0.08
793: Bertrand-----	85	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00
793B: Bertrand-----	100	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application	1.00 0.08
806B: Whalan-----	80	Somewhat limited Slow water movement Depth to bedrock Droughty	0.89 0.46 0.33	Somewhat limited Slow water movement Depth to bedrock Droughty	0.78 0.46 0.33	Somewhat limited Slow water movement Depth to bedrock Droughty	0.78 0.46 0.33
806C2: Whalan, moderately eroded-----	80	Somewhat limited Slow water movement Depth to bedrock Droughty	0.89 0.46 0.33	Somewhat limited Slow water movement Depth to bedrock Droughty	0.78 0.46 0.33	Somewhat limited Too steep for surface application Slow water movement Depth to bedrock	0.92 0.78 0.46
806D: Whalan-----	80	Somewhat limited Slow water movement Slope Depth to bedrock	0.89 0.63 0.46	Somewhat limited Slow water movement Slope Depth to bedrock	0.78 0.63 0.46	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	1.00 0.78 0.78
813B: Atkinson-----	55	Somewhat limited Too acid	0.03	Somewhat limited Too acid	0.14	Somewhat limited Too acid	0.14

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
814: Rockton-----	95	Somewhat limited Depth to bedrock Droughty Too acid	 0.46 0.02 0.02	Somewhat limited Depth to bedrock Too acid Droughty	 0.46 0.07 0.02	Somewhat limited Depth to bedrock Too acid Droughty	 0.46 0.07 0.02
814B: Rockton-----	85	Somewhat limited Depth to bedrock Droughty Too acid	 0.46 0.02 0.02	Somewhat limited Depth to bedrock Too acid Droughty	 0.46 0.07 0.02	Somewhat limited Depth to bedrock Too acid Droughty	 0.46 0.07 0.02
814C: Rockton-----	85	Somewhat limited Depth to bedrock Droughty Too acid	 0.46 0.02 0.02	Somewhat limited Depth to bedrock Too acid Droughty	 0.46 0.07 0.02	Somewhat limited Too steep for surface application Depth to bedrock Too acid	 0.92 0.46 0.07
814D: Rockton-----	75	Somewhat limited Slope Depth to bedrock Droughty	 0.63 0.46 0.02	Somewhat limited Slope Depth to bedrock Too acid	 0.63 0.46 0.07	Very limited Too steep for surface application Too steep for sprinkler application Depth to bedrock	 1.00 0.78 0.46
837D2: Village, moderately eroded-----	75	Very limited Slow water movement Slope Too acid	 1.00 0.63 0.02	Very limited Slow water movement Slope Too acid	 1.00 0.63 0.07	Very limited Too steep for surface application Slow water movement Too steep for sprinkler application	 1.00 1.00 0.78
837E2: Village, moderately eroded-----	80	Very limited Slow water movement Slope Too acid	 1.00 1.00 0.02	Very limited Slow water movement Slope Too acid	 1.00 1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	 1.00 1.00 1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
838D: Allamakee-----	90	Very limited Slow water movement Slope Runoff	1.00 0.63 0.40	Very limited Slow water movement Slope Too acid	1.00 0.63 0.07	Very limited Too steep for surface application Slow water movement Too steep for sprinkler application	1.00 1.00 0.78
838E: Allamakee-----	90	Very limited Slow water movement Slope Runoff	1.00 1.00 0.40	Very limited Slow water movement Slope Too acid	1.00 1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	1.00 1.00 1.00 1.00
840E: Lacrescent-----	75	Very limited Cobble content Slope Droughty	1.00 0.63 0.02	Very limited Cobble content Slope Droughty	1.00 0.63 0.02	Very limited Cobble content Too steep for surface application Too steep for sprinkler application	1.00 1.00 0.78
840G: Lacrescent-----	75	Very limited Slope Cobble content Droughty	1.00 1.00 0.02	Very limited Slope Cobble content Droughty	1.00 1.00 0.02	Very limited Too steep for sprinkler application Too steep for surface application Cobble content	1.00 1.00 1.00 1.00
841G: Boone-----	65	Very limited Slope Filtering capacity Droughty	1.00 1.00 1.00	Very limited Filtering capacity Slope Droughty	1.00 1.00 1.00	Very limited Filtering capacity Too steep for sprinkler application Too steep for surface application	1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
861E: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
861F: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application	1.00
						Too steep for surface application	1.00
903C: Frankville-----	75	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for surface application	0.92
		Droughty	0.02	Droughty	0.02	Depth to bedrock	0.46
903D2: Frankville, moderately eroded--	75	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Too steep for surface application	1.00
		Slope	0.63	Slope	0.63	Slow water movement	1.00
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for sprinkler application	0.78
903E2: Frankville, moderately eroded--	75	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Too steep for surface application	1.00
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Depth to bedrock	0.46	Depth to bedrock	0.46	Slow water movement	1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
912F: Paintcreek-----	95	Very limited Slope Slow water movement Too acid	1.00 1.00 0.02	Very limited Slope Slow water movement Too acid	1.00 1.00 0.07	Very limited Too steep for sprinkler application Too steep for surface application Slow water movement	1.00 1.00 1.00 1.00
914B: Winneshiek-----	85	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.55 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.55 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.55 0.46
914C: Winneshiek-----	75	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.55 0.46	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.55 0.46	Very limited Slow water movement Too steep for surface application Droughty	1.00 0.92 0.55
914D: Winneshiek-----	80	Very limited Slow water movement Slope Droughty	1.00 0.63 0.55	Very limited Slow water movement Slope Droughty	1.00 0.63 0.55	Very limited Too steep for surface application Slow water movement Too steep for sprinkler application	1.00 1.00 0.78
914E: Winneshiek-----	80	Very limited Slow water movement Slope Droughty	1.00 1.00 0.55	Very limited Slow water movement Slope Droughty	1.00 1.00 0.55	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	1.00 1.00 1.00 1.00
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.40	Very limited Depth to saturated zone (Nov-Jul)	1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965C2: Dubuque, moderately eroded-----	55	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.46 0.16	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.46 0.16	Very limited Slow water movement Too steep for surface application Depth to bedrock	1.00 0.92 0.46
Fayette, moderately eroded-----	40	Somewhat limited Too acid Slope	0.02 0.01	Somewhat limited Too acid Slope	0.07 0.01	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 0.10 0.07
965D2: Dubuque, moderately eroded-----	50	Very limited Slow water movement Slope Depth to bedrock	1.00 0.63 0.46	Very limited Slow water movement Slope Depth to bedrock	1.00 0.63 0.46	Very limited Too steep for surface application Slow water movement Too steep for sprinkler application	1.00 1.00 0.78
Fayette, moderately eroded-----	30	Somewhat limited Slope Too acid	0.63 0.02	Somewhat limited Slope Too acid	0.63 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 0.78 0.07
965E2: Dubuque, moderately eroded-----	50	Very limited Slow water movement Slope Depth to bedrock	1.00 1.00 0.46	Very limited Slow water movement Slope Depth to bedrock	1.00 1.00 0.46	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	1.00 1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965E2: Fayette, moderately eroded-----	30	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 1.00 0.07
965G: Dubuque-----	55	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 0.46	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 0.46	Very limited Too steep for sprinkler application Too steep for surface application Slow water movement	1.00 1.00 1.00 1.00
Fayette-----	40	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for sprinkler application Too steep for surface application Too acid	1.00 1.00 0.07
978: Festina-----	100	Not limited		Not limited		Not limited	
978B: Festina-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone (Nov-Jul) Leaching Too acid	1.00 0.70 0.02	Very limited Depth to saturated zone (Nov-Jul) Flooding Too acid	1.00 0.40 0.07	Very limited Depth to saturated zone (Nov-Jul) Too acid	1.00 0.07
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone (Nov-Jul) Leaching Too acid	1.00 0.70 0.02	Very limited Depth to saturated zone (Nov-Jul) Flooding Too acid	1.00 0.40 0.07	Very limited Depth to saturated zone (Nov-Jul) Too acid	1.00 0.07

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1084: Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone (Nov-Jul)	1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.40	Very limited Depth to saturated zone (Nov-Jul)	1.00
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone (Nov-Jul) Leaching	1.00 0.70	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.40	Very limited Depth to saturated zone (Nov-Jul)	1.00
1489B: Lawson, frequently flooded-----	55	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00
Ossian, frequently flooded-----	40	Very limited Depth to saturated zone (Nov-Jul) Flooding Leaching	1.00 1.00 0.70	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00
1763E2: Fayette, moderately eroded-----	50	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for surface application Too steep for sprinkler application Too acid	1.00 1.00 0.07
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Too acid	1.00 0.02	Very limited Slope Too acid	1.00 0.07	Very limited Too steep for sprinkler application Too steep for surface application Too acid	1.00 1.00 0.07
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application Too steep for surface application	1.00 1.00
1936: Udifluvents, channeled, frequently flooded	50	Very limited Flooding Leaching Filtering capacity	1.00 0.45 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Very limited Flooding Filtering capacity	1.00 0.01
Spillville, channeled, frequently flooded	35	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Very limited Depth to saturated zone (Nov-Jul) Flooding	1.00 0.60
Waukee-----	35	Very limited Filtering capacity Too acid	1.00 0.03	Very limited Filtering capacity Too acid	1.00 0.14	Very limited Filtering capacity Too acid	1.00 0.14
2551: Calamine-----	50	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2551: Jacwin-----	35	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff	1.00 1.00 0.40	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul)	1.00 1.00
2671: Ion, occasionally flooded-----	65	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
Eitzen, occasionally flooded-----	35	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080: Udorthents-----	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	

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

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Not limited		Not limited		Somewhat limited Slope	0.50
41: Sparta-----	100	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95
41B: Sparta-----	100	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy Slope	0.95 0.50
41D: Sparta-----	100	Somewhat limited Too sandy Slope	0.95 0.16	Somewhat limited Too sandy Slope	0.95 0.16	Very limited Slope Too sandy	1.00 0.95
63B: Chelsea-----	85	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy Slope	0.95 0.50
63D: Chelsea-----	75	Somewhat limited Too sandy Slope	0.95 0.16	Somewhat limited Too sandy Slope	0.95 0.16	Very limited Slope Too sandy	1.00 0.95
84: Clyde-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
85: Eitzen, occasionally flooded-----	75	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
98: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
98B: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding Slope	0.60 0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
109B: Backbone-----	80	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement Slope Depth to bedrock	0.94 0.50 0.46
109C: Backbone-----	75	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
109D: Backbone-----	80	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
135: Coland, occasionally flooded-----	90	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
136B: Ankeny-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
162B: Downs-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
162C: Downs-----	95	Not limited		Not limited		Very limited Slope	1.00
162D: Downs-----	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
162E2: Downs, moderately eroded-----	80	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
163B: Fayette-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
163C2: Fayette, moderately eroded-----	90	Not limited		Not limited		Very limited Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163D2: Fayette, moderately eroded-----	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
163E2: Fayette, moderately eroded-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
163F: Fayette-----	80	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
163G: Fayette-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
175B: Dickinson-----	85	Not limited		Not limited		Somewhat limited Slope	0.12
177C2: Saude, moderately eroded-----	90	Not limited		Not limited		Very limited Slope	1.00
178: Waukee-----	85	Not limited		Not limited		Not limited	
178B: Waukee-----	75	Not limited		Not limited		Somewhat limited Slope	0.12
196: Volney, occasionally flooded-----	95	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding Gravel content	0.60 0.22
196+: Volney, occasionally flooded, overwash--	95	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
196B: Volney, rarely flooded-----	95	Very limited Flooding	1.00	Not limited		Somewhat limited Gravel content Slope	0.22 0.12
198B: Floyd-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.12

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
221: Klossner-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
221+: Klossner, occasionally flooded, overwash--	95	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Coland, occasionally flooded-----	25	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
241B: Lilah-----	70	Not limited		Not limited		Somewhat limited Slope	0.12
Dickinson-----	20	Not limited		Not limited		Somewhat limited Slope	0.12
241C: Lilah-----	60	Not limited		Not limited		Very limited Slope	1.00
Dickinson-----	25	Not limited		Not limited		Very limited Slope	1.00
241D: Lilah-----	60	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Dickinson-----	40	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
285B: Burkhardt-----	75	Not limited		Not limited		Somewhat limited Slope	0.50
285F: Burkhardt-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
291B: Atterberry-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
302B: Coggon-----	80	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Somewhat limited Slow water movement Depth to saturated zone Slope	0.96 0.39 0.12
302C: Coggon-----	75	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Very limited Slope Slow water movement Depth to saturated zone	1.00 0.96 0.39
302C2: Coggon, moderately eroded-----	80	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Very limited Slope Slow water movement Depth to saturated zone	1.00 0.96 0.39
320: Arenzville, occasionally flooded-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
391B: Clyde-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Floyd-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00 0.12
394B: Ostrander-----	80	Somewhat limited Slow water movement	0.96	Somewhat limited Slow water movement	0.96	Somewhat limited Slow water movement Slope	0.96 0.50
394C: Ostrander-----	85	Somewhat limited Slow water movement	0.96	Somewhat limited Slow water movement	0.96	Very limited Slope Slow water movement	1.00 0.96
395B: Marquis-----	100	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Somewhat limited Slow water movement Slope Depth to saturated zone	0.96 0.50 0.39

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
444: Jacwin-----	80	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00
444B: Jacwin-----	75	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 0.50
444C: Jacwin-----	75	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 1.00
468B: Dunkerton-----	70	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement Slope	1.00 0.96 0.50
471: Oran-----	80	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement	1.00 0.96
471B: Oran-----	90	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement	1.00 0.96	Very limited Depth to saturated zone Slow water movement Slope	1.00 0.96 0.12
480B: Orwood-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
480C2: Orwood, moderately eroded-----	100	Not limited		Not limited		Very limited Slope	1.00
480D2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
480E2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480F2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
482B: Racine-----	80	Somewhat limited Slow water movement	0.96	Somewhat limited Slow water movement	0.96	Somewhat limited Slow water movement Slope	0.96 0.12
484: Lawson, occasionally flooded-----	90	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
485: Spillville, occasionally flooded-----	100	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
487B: Otter, frequently flooded-----	50	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
Worthen-----	40	Not limited		Not limited		Somewhat limited Slope	0.12
489: Ossian, occasionally flooded-----	95	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
491D2: Renova, moderately eroded-----	80	Somewhat limited Slow water movement Slope	0.96 0.63	Somewhat limited Slow water movement Slope	0.96 0.63	Very limited Slope Slow water movement	1.00 0.96

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
491E2: Renova, moderately eroded-----	85	Very limited Slope Slow water movement	1.00 0.96	Very limited Slope Slow water movement	1.00 0.96	Very limited Slope Slow water movement	1.00 0.96
499D: Nordness-----	75	Very limited Depth to bedrock Slow water movement Slope	1.00 0.94 0.63	Very limited Depth to bedrock Slow water movement Slope	1.00 0.94 0.63	Very limited Depth to bedrock Slope Slow water movement	1.00 1.00 0.94
499G: Nordness-----	75	Very limited Slope Depth to bedrock Slow water movement	1.00 1.00 0.94	Very limited Slope Depth to bedrock Slow water movement	1.00 1.00 0.94	Very limited Slope Depth to bedrock Slow water movement	1.00 1.00 0.94
512B: Marlean-----	90	Not limited		Not limited		Somewhat limited Slope	0.50
512C: Marlean-----	75	Not limited		Not limited		Very limited Slope	1.00
512C2: Marlean, moderately eroded-----	75	Not limited		Not limited		Very limited Slope	1.00
512D2: Marlean, moderately eroded-----	75	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
512E2: Marlean, moderately eroded-----	80	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
582B: Kasson-----	85	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Somewhat limited Slow water movement Slope Depth to saturated zone	0.96 0.50 0.39
582C: Kasson-----	95	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Very limited Slope Slow water movement Depth to saturated zone	1.00 0.96 0.39

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
582C2: Kasson, moderately eroded-----	85	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.39	Somewhat limited Slow water movement Depth to saturated zone	0.96 0.19	Very limited Slope Slow water movement Depth to saturated zone	1.00 0.96 0.39
626: Hayfield-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
762B: Downs-----	55	Not limited		Not limited		Somewhat limited Slope	0.50
Tama-----	45	Not limited		Not limited		Somewhat limited Slope	0.50
762C: Downs-----	50	Not limited		Not limited		Very limited Slope	1.00
Tama-----	50	Not limited		Not limited		Very limited Slope	1.00
775B: Billett-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
775C: Billett-----	90	Not limited		Not limited		Very limited Slope	1.00
775D: Billett-----	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
782B: Donnan-----	90	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement Slope	1.00 1.00 0.50
793: Bertrand-----	85	Not limited		Not limited		Not limited	
793B: Bertrand-----	100	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		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
806B: Whalan-----	80	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement Depth to bedrock Slope	0.60 0.46 0.12
806C2: Whalan, moderately eroded-----	80	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Very limited Slope Slow water movement Depth to bedrock	1.00 0.60 0.46
806D: Whalan-----	80	Somewhat limited Slope Slow water movement	0.63 0.60	Somewhat limited Slope Slow water movement	0.63 0.60	Very limited Slope Slow water movement Depth to bedrock	1.00 0.60 0.46
813B: Atkinson-----	55	Not limited		Not limited		Somewhat limited Slope	0.12
814: Rockton-----	95	Not limited		Not limited		Not limited	
814B: Rockton-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock Slope	0.46 0.12
814C: Rockton-----	85	Not limited		Not limited		Very limited Slope Depth to bedrock	1.00 0.46
814D: Rockton-----	75	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope Depth to bedrock	1.00 0.46
837D2: Village, moderately eroded-----	75	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement	1.00 0.94
837E2: Village, moderately eroded-----	80	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
838D: Allamakee-----	90	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement	1.00 0.94
838E: Allamakee-----	90	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94
840E: Lacrescent-----	75	Somewhat limited Slope Content of large stones	0.63 0.26	Somewhat limited Slope Content of large stones	0.63 0.26	Very limited Slope Gravel content Content of large stones	1.00 0.88 0.26
840G: Lacrescent-----	75	Very limited Slope Content of large stones	1.00 0.26	Very limited Slope Content of large stones	1.00 0.26	Very limited Slope Gravel content Content of large stones	1.00 0.88 0.26
841G: Boone-----	65	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy Depth to bedrock	1.00 0.88 0.46
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
861F: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
903C: Frankville-----	75	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
903D2: Frankville, moderately eroded--	75	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
903E2: Frankville, moderately eroded--	75	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
912F: Paintcreek-----	95	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94
914B: Winneshiek-----	85	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement Slope Depth to bedrock	0.94 0.50 0.46
914C: Winneshiek-----	75	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
914D: Winneshiek-----	80	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
914E: Winneshiek-----	80	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
965C2: Dubuque, moderately eroded-----	55	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
Fayette, moderately eroded-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965D2: Dubuque, moderately eroded-----	50	Somewhat limited Slow water movement Slope	0.94 0.63	Somewhat limited Slow water movement Slope	0.94 0.63	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
Fayette, moderately eroded-----	30	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
965E2: Dubuque, moderately eroded-----	50	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
Fayette, moderately eroded-----	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
965G: Dubuque-----	55	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement	1.00 0.94	Very limited Slope Slow water movement Depth to bedrock	1.00 0.94 0.46
Fayette-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
978: Festina-----	100	Not limited		Not limited		Not limited	
978B: Festina-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1489B: Lawson, frequently flooded-----	55	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
Ossian, frequently flooded-----	40	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
1763E2: Fayette, moderately eroded-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1763F2: Fayette, moderately eroded-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1936: Udifluvents, channeled, frequently flooded	50	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Spillville, channeled, frequently flooded	35	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Waukee-----	35	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2551:							
Calamine-----	50	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00
Jacwin-----	35	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00
2671:							
Ion, occasionally flooded-----	65	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Eitzen, occasionally flooded-----	35	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
5010:							
Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030:							
Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080:							
Udorthents-----	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	

Paths, Trails, and Golf Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Not limited		Not limited		Not limited	
41: Sparta-----	100	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Droughty	0.07
41B: Sparta-----	100	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Droughty	0.07
41D: Sparta-----	100	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Slope Droughty	0.16 0.07
63B: Chelsea-----	85	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Droughty	0.28
63D: Chelsea-----	75	Somewhat limited Too sandy	0.95	Somewhat limited Too sandy	0.95	Somewhat limited Droughty Slope	0.28 0.16
84: Clyde-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
85: Eitzen, occasionally flooded-----	75	Not limited		Not limited		Somewhat limited Flooding	0.60
98: Huntsville, occasionally flooded-----	100	Not limited		Not limited		Somewhat limited Flooding	0.60
98B: Huntsville, occasionally flooded-----	100	Not limited		Not limited		Somewhat limited Flooding	0.60
109B: Backbone-----	80	Not limited		Not limited		Somewhat limited Depth to bedrock Droughty	0.46 0.02

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
109C: Backbone-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock Droughty	0.46 0.02
109D: Backbone-----	80	Not limited		Not limited		Somewhat limited Slope Depth to bedrock Droughty	0.63 0.46 0.02
135: Coland, occasionally flooded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
136B: Ankeny-----	100	Not limited		Not limited		Not limited	
162B: Downs-----	100	Not limited		Not limited		Not limited	
162C: Downs-----	95	Not limited		Not limited		Not limited	
162D: Downs-----	80	Not limited		Not limited		Somewhat limited Slope	0.63
162E2: Downs, moderately eroded-----	80	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
163B: Fayette-----	100	Not limited		Not limited		Not limited	
163C2: Fayette, moderately eroded-----	90	Not limited		Not limited		Not limited	
163D2: Fayette, moderately eroded-----	80	Not limited		Not limited		Somewhat limited Slope	0.63
163E2: Fayette, moderately eroded-----	75	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
163F: Fayette-----	80	Somewhat limited Slope	0.82	Not limited		Very limited Slope	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163G: Fayette-----	95	Very limited Slope	1.00	Somewhat limited Slope	0.56	Very limited Slope	1.00
175B: Dickinson-----	85	Not limited		Not limited		Not limited	
177C2: Saude, moderately eroded-----	90	Not limited		Not limited		Not limited	
178: Waukee-----	85	Not limited		Not limited		Not limited	
178B: Waukee-----	75	Not limited		Not limited		Not limited	
196: Volney, occasionally flooded-----	95	Not limited		Not limited		Somewhat limited Content of large stones Flooding	0.92 0.60
196+: Volney, occasionally flooded, overwash--	95	Not limited		Not limited		Somewhat limited Flooding	0.60
196B: Volney, rarely flooded-----	95	Not limited		Not limited		Somewhat limited Content of large stones	0.92
198B: Floyd-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
221: Klossner-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
221+: Klossner, occasionally flooded, overwash--	95	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
235: Coland, occasionally flooded-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
241B: Lilah-----	70	Not limited		Not limited		Somewhat limited Droughty	0.88
Dickinson-----	20	Not limited		Not limited		Not limited	
241C: Lilah-----	60	Not limited		Not limited		Somewhat limited Droughty	0.88
Dickinson-----	25	Not limited		Not limited		Not limited	
241D: Lilah-----	60	Not limited		Not limited		Somewhat limited Droughty Slope	0.88 0.63
Dickinson-----	40	Not limited		Not limited		Somewhat limited Slope	0.63
285B: Burkhardt-----	75	Not limited		Not limited		Somewhat limited Droughty	0.52
285F: Burkhardt-----	75	Somewhat limited Slope	0.18	Not limited		Very limited Slope Droughty	1.00 0.52
291B: Atterberry-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
302B: Coggon-----	80	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
302C: Coggon-----	75	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
302C2: Coggon, moderately eroded-----	80	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
320: Arenzville, occasionally flooded-----	100	Not limited		Not limited		Somewhat limited Flooding	0.60
391B: Clyde-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Floyd-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
394B: Ostrander-----	80	Not limited		Not limited		Not limited	
394C: Ostrander-----	85	Not limited		Not limited		Not limited	
395B: Marquis-----	100	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
444: Jacwin-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
444B: Jacwin-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
444C: Jacwin-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
468B: Dunkerton-----	70	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
471: Oran-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
471B: Oran-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
480B: Orwood-----	100	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
480C2: Orwood, moderately eroded-----	100	Not limited		Not limited		Not limited	
480D2: Orwood, moderately eroded-----	85	Not limited		Not limited		Somewhat limited Slope	0.63
480E2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
480E3: Orwood, severely eroded-----	90	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
480F2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.68	Not limited		Very limited Slope	1.00
482B: Racine-----	80	Not limited		Not limited		Not limited	
484: Lawson, occasionally flooded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
485: Spillville, occasionally flooded-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
487B: Otter, frequently flooded-----	50	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
Worthen-----	40	Not limited		Not limited		Not limited	
489: Ossian, occasionally flooded-----	95	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
491D2: Renova, moderately eroded-----	80	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
491E2: Renova, moderately eroded-----	85	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope	1.00
499D: Nordness-----	75	Not limited		Not limited		Very limited Depth to bedrock Slope Droughty	1.00 0.63 0.57
499G: Nordness-----	75	Very limited Slope	1.00	Somewhat limited Slope	0.04	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.57
512B: Marlean-----	90	Not limited		Not limited		Somewhat limited Content of large stones	0.08
512C: Marlean-----	75	Not limited		Not limited		Somewhat limited Content of large stones	0.08
512C2: Marlean, moderately eroded-----	75	Not limited		Not limited		Somewhat limited Content of large stones	0.08
512D2: Marlean, moderately eroded-----	75	Not limited		Not limited		Somewhat limited Slope Content of large stones	0.16 0.08
512E2: Marlean, moderately eroded-----	80	Somewhat limited Slope	0.02	Not limited		Very limited Slope Content of large stones	1.00 0.08
582B: Kasson-----	85	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
582C: Kasson-----	95	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
582C2: Kasson, moderately eroded-----	85	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
626: Hayfield-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
762B: Downs-----	55	Not limited		Not limited		Not limited	
Tama-----	45	Not limited		Not limited		Not limited	
762C: Downs-----	50	Not limited		Not limited		Not limited	
Tama-----	50	Not limited		Not limited		Not limited	
775B: Billett-----	100	Not limited		Not limited		Not limited	
775C: Billett-----	90	Not limited		Not limited		Not limited	
775D: Billett-----	90	Not limited		Not limited		Somewhat limited Slope	0.63
782B: Donnan-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
793: Bertrand-----	85	Not limited		Not limited		Not limited	
793B: Bertrand-----	100	Not limited		Not limited		Not limited	
806B: Whalan-----	80	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
806C2: Whalan, moderately eroded-----	80	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
806D: Whalan-----	80	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.63 0.46

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
813B: Atkinson-----	55	Not limited		Not limited		Not limited	
814: Rockton-----	95	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
814B: Rockton-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
814C: Rockton-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
814D: Rockton-----	75	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.63 0.46
837D2: Village, moderately eroded-----	75	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
837E2: Village, moderately eroded-----	80	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope	1.00
838D: Allamakee-----	90	Not limited		Not limited		Somewhat limited Slope	0.63
838E: Allamakee-----	90	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
840E: Lacrescent-----	75	Somewhat limited Content of large stones	0.26	Somewhat limited Content of large stones	0.26	Very limited Content of large stones Slope	1.00 0.63
840G: Lacrescent-----	75	Very limited Slope Content of large stones	1.00 0.26	Somewhat limited Slope Content of large stones	0.44 0.26	Very limited Slope Content of large stones	1.00 1.00
841G: Boone-----	65	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Too sandy	1.00 0.88	Very limited Slope Droughty Depth to bedrock	1.00 0.85 0.46
Rock outcrop-----	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		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
861E: Yellowriver-----	95	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope	1.00
861F: Yellowriver-----	95	Very limited Water erosion Slope	1.00 0.82	Very limited Water erosion	1.00	Very limited Slope	1.00
903C: Frankville-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
903D2: Frankville, moderately eroded--	75	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope Depth to bedrock	0.63 0.46
903E2: Frankville, moderately eroded--	75	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope Depth to bedrock	1.00 0.46
912F: Paintcreek-----	95	Very limited Water erosion Slope	1.00 0.98	Very limited Water erosion	1.00	Very limited Slope	1.00
914B: Winneshiek-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
914C: Winneshiek-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46
914D: Winneshiek-----	80	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.63 0.46
914E: Winneshiek-----	80	Somewhat limited Slope	0.02	Not limited		Very limited Slope Depth to bedrock	1.00 0.46
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
965C2: Dubuque, moderately eroded-----	55	Not limited		Not limited		Somewhat limited Depth to bedrock	0.46

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965C2: Fayette, moderately eroded-----	40	Not limited		Not limited		Somewhat limited Slope	0.01
965D2: Dubuque, moderately eroded-----	50	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope Depth to bedrock	0.63 0.46
Fayette, moderately eroded-----	30	Not limited		Not limited		Somewhat limited Slope	0.63
965E2: Dubuque, moderately eroded-----	50	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope Depth to bedrock	1.00 0.46
Fayette, moderately eroded-----	30	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
965G: Dubuque-----	55	Very limited Water erosion Slope	1.00 0.50	Very limited Water erosion	1.00	Very limited Slope Depth to bedrock	1.00 0.46
Fayette-----	40	Somewhat limited Slope	0.50	Not limited		Very limited Slope	1.00
978: Festina-----	100	Not limited		Not limited		Not limited	
978B: Festina-----	100	Not limited		Not limited		Not limited	
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
1489B: Lawson, frequently flooded-----	55	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
Ossian, frequently flooded-----	40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
1763E2: Fayette, moderately eroded-----	50	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Water erosion Slope	1.00 0.02	Very limited Water erosion	1.00	Very limited Slope	1.00
1763F2: Fayette, moderately eroded-----	50	Somewhat limited Slope	0.82	Not limited		Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Water erosion Slope	1.00 0.82	Very limited Water erosion	1.00	Very limited Slope	1.00
1936: Udifluvents, channeled, frequently flooded	50	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Spillville, channeled, frequently flooded	35	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2486: Waukee-----	35	Not limited		Not limited		Not limited	
2551: Calamine-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Jacwin-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
2671: Ion, occasionally flooded-----	65	Not limited		Not limited		Somewhat limited Flooding	0.60
Eitzen, occasionally flooded-----	35	Not limited		Not limited		Somewhat limited Flooding	0.60
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080: Udorthents-----	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	

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

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
41: Sparta-----	100	Not limited		Not limited		Not limited	
41B: Sparta-----	100	Not limited		Not limited		Not limited	
41D: Sparta-----	100	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
63B: Chelsea-----	85	Not limited		Not limited		Not limited	
63D: Chelsea-----	75	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
84: Clyde-----	75	Very limited Depth to saturated zone Shrink-swell	1.00 0.18	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 0.18
85: Eitzen, occasionally flooded-----	75	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
98: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
98B: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
109B: Backbone-----	80	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.46

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
109C: Backbone-----	75	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Slope Depth to hard bedrock	0.88 0.46
109D: Backbone-----	80	Somewhat limited Slope Depth to hard bedrock	0.63 0.46	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Slope Depth to hard bedrock	1.00 0.46
135: Coland, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
136B: Ankeny-----	100	Not limited		Not limited		Not limited	
162B: Downs-----	100	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06
162C: Downs-----	95	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06	Somewhat limited Slope Shrink-swell	0.88 0.06
162D: Downs-----	80	Somewhat limited Slope Shrink-swell	0.63 0.06	Somewhat limited Slope Shrink-swell	0.63 0.06	Very limited Slope Shrink-swell	1.00 0.06
162E2: Downs, moderately eroded-----	80	Very limited Slope Shrink-swell	1.00 0.06	Very limited Slope	1.00	Very limited Slope Shrink-swell	1.00 0.06
163B: Fayette-----	100	Somewhat limited Shrink-swell	0.01	Not limited		Somewhat limited Shrink-swell	0.01
163C2: Fayette, moderately eroded-----	90	Somewhat limited Shrink-swell	0.01	Somewhat limited Shrink-swell	0.01	Somewhat limited Slope Shrink-swell	0.88 0.01
163D2: Fayette, moderately eroded-----	80	Somewhat limited Slope Shrink-swell	0.63 0.01	Somewhat limited Slope Shrink-swell	0.63 0.01	Very limited Slope Shrink-swell	1.00 0.01

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163E2: Fayette, moderately eroded-----	75	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01
163F: Fayette-----	80	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01
163G: Fayette-----	95	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01
175B: Dickinson-----	85	Not limited		Not limited		Not limited	
177C2: Saude, moderately eroded-----	90	Not limited		Not limited		Somewhat limited Slope	0.88
178: Waukee-----	85	Not limited		Not limited		Not limited	
178B: Waukee-----	75	Not limited		Not limited		Not limited	
196: Volney, occasionally flooded-----	95	Very limited Flooding Content of large stones	1.00 0.18	Very limited Flooding Content of large stones	1.00 0.18	Very limited Flooding Content of large stones	1.00 0.18
196+: Volney, occasionally flooded, overwash--	95	Very limited Flooding Content of large stones	1.00 0.02	Very limited Flooding Content of large stones	1.00 0.02	Very limited Flooding Content of large stones	1.00 0.02
196B: Volney, rarely flooded-----	95	Very limited Flooding Content of large stones	1.00 0.18	Very limited Flooding Content of large stones	1.00 0.18	Very limited Flooding Content of large stones	1.00 0.18
198B: Floyd-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
221: Klossner-----	75	Very limited Subsidence Depth to saturated zone Content of organic matter	1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone	1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter	1.00 1.00 1.00
221+: Klossner, occasionally flooded, overwash--	95	Very limited Subsidence Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Subsidence Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Subsidence Flooding Depth to saturated zone	1.00 1.00 1.00
235: Turlin, rarely flooded-----	55	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Coland, occasionally flooded-----	25	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
241B: Lilah-----	70	Not limited		Not limited		Not limited	
Dickinson-----	20	Not limited		Not limited		Not limited	
241C: Lilah-----	60	Not limited		Not limited		Somewhat limited Slope	0.88
Dickinson-----	25	Not limited		Not limited		Somewhat limited Slope	0.88
241D: Lilah-----	60	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Dickinson-----	40	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
285B: Burkhardt-----	75	Not limited		Not limited		Not limited	
285F: Burkhardt-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
291B: Atterberry-----	100	Very limited Depth to saturated zone Shrink-swell	1.00 0.32	Very limited Depth to saturated zone Shrink-swell	1.00 0.32	Very limited Depth to saturated zone Shrink-swell	1.00 0.32
302B: Coggon-----	80	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
302C: Coggon-----	75	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Slope Depth to saturated zone	0.88 0.39
302C2: Coggon, moderately eroded-----	80	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Slope Depth to saturated zone	0.88 0.39
320: Arenzville, occasionally flooded-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
391B: Clyde-----	45	Very limited Depth to saturated zone Shrink-swell	1.00 0.18	Very limited Depth to saturated zone Shrink-swell	1.00 0.18	Very limited Depth to saturated zone Shrink-swell	1.00 0.18
Floyd-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
394B: Ostrander-----	80	Not limited		Not limited		Not limited	
394C: Ostrander-----	85	Not limited		Not limited		Somewhat limited Slope	0.50
395B: Marquis-----	100	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
444: Jacwin-----	80	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
444B: Jacwin-----	75	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
444C: Jacwin-----	75	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.88
468B: Dunkerton-----	70	Very limited Depth to saturated zone Shrink-swell	1.00 0.06	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 0.06
471: Oran-----	80	Very limited Depth to saturated zone Shrink-swell	1.00 0.06	Very limited Depth to saturated zone Shrink-swell	1.00 0.06	Very limited Depth to saturated zone Shrink-swell	1.00 0.06
471B: Oran-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 0.06	Very limited Depth to saturated zone Shrink-swell	1.00 0.06	Very limited Depth to saturated zone Shrink-swell	1.00 0.06
480B: Orwood-----	100	Not limited		Not limited		Not limited	
480C2: Orwood, moderately eroded-----	100	Not limited		Not limited		Somewhat limited Slope	0.88
480D2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
480E2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480F2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
482B: Racine-----	80	Somewhat limited Shrink-swell	0.01	Not limited		Somewhat limited Shrink-swell	0.01
484: Lawson, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
485: Spillville, occasionally flooded-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
487B: Otter, frequently flooded-----	50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Worthen-----	40	Not limited		Not limited		Not limited	
489: Ossian, occasionally flooded-----	95	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
491D2: Renova, moderately eroded-----	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
491E2: Renova, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
499D: Nordness-----	75	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Depth to hard bedrock Slope	1.00 1.00
499G: Nordness-----	75	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
512B: Marlean-----	90	Somewhat limited Content of large stones	0.12	Somewhat limited Content of large stones	0.12	Somewhat limited Content of large stones	0.12
512C: Marlean-----	75	Somewhat limited Content of large stones	0.29	Somewhat limited Content of large stones	0.29	Somewhat limited Slope Content of large stones	0.88 0.29
512C2: Marlean, moderately eroded-----	75	Somewhat limited Content of large stones	0.29	Somewhat limited Content of large stones	0.29	Somewhat limited Slope Content of large stones	0.88 0.29
512D2: Marlean, moderately eroded-----	75	Somewhat limited Content of large stones Slope	0.29 0.16	Somewhat limited Content of large stones Slope	0.29 0.16	Very limited Slope Content of large stones	1.00 0.29
512E2: Marlean, moderately eroded-----	80	Very limited Slope Content of large stones	1.00 0.29	Very limited Slope Content of large stones	1.00 0.29	Very limited Slope Content of large stones	1.00 0.29
582B: Kasson-----	85	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
582C: Kasson-----	95	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Slope Depth to saturated zone	0.88 0.39
582C2: Kasson, moderately eroded-----	85	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Slope Depth to saturated zone	0.88 0.39
626: Hayfield-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
762B: Downs-----	55	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
762B: Tama-----	45	Somewhat limited Shrink-swell	0.01	Somewhat limited Shrink-swell	0.01	Somewhat limited Shrink-swell	0.01
762C: Downs-----	50	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.06	Somewhat limited Slope Shrink-swell	0.88 0.06
Tama-----	50	Somewhat limited Shrink-swell	0.01	Somewhat limited Shrink-swell	0.01	Somewhat limited Slope Shrink-swell	0.88 0.01
775B: Billett-----	100	Not limited		Not limited		Not limited	
775C: Billett-----	90	Not limited		Not limited		Somewhat limited Slope	0.88
775D: Billett-----	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
782B: Donnan-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
793: Bertrand-----	85	Not limited		Not limited		Not limited	
793B: Bertrand-----	100	Not limited		Not limited		Not limited	
806B: Whalan-----	80	Somewhat limited Depth to hard bedrock Shrink-swell	0.46 0.06	Very limited Depth to hard bedrock Shrink-swell	1.00 0.06	Somewhat limited Depth to hard bedrock Shrink-swell	0.46 0.06
806C2: Whalan, moderately eroded-----	80	Somewhat limited Depth to hard bedrock Shrink-swell	0.46 0.06	Very limited Depth to hard bedrock Shrink-swell	1.00 0.06	Somewhat limited Slope Depth to hard bedrock Shrink-swell	0.88 0.46 0.06
806D: Whalan-----	80	Somewhat limited Slope Depth to hard bedrock Shrink-swell	0.63 0.46 0.06	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.63 0.06	Very limited Slope Depth to hard bedrock Shrink-swell	1.00 0.46 0.06

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
813B: Atkinson-----	55	Somewhat limited Shrink-swell	0.32	Somewhat limited Depth to hard bedrock Shrink-swell	0.64 0.32	Somewhat limited Shrink-swell	0.32
814: Rockton-----	95	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.46
814B: Rockton-----	85	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.46
814C: Rockton-----	85	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Slope Depth to hard bedrock	0.88 0.46
814D: Rockton-----	75	Somewhat limited Slope Depth to hard bedrock	0.63 0.46	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Slope Depth to hard bedrock	1.00 0.46
837D2: Village, moderately eroded-----	75	Somewhat limited Slope Shrink-swell	0.63 0.06	Somewhat limited Slope Shrink-swell	0.63 0.06	Very limited Slope Shrink-swell	1.00 0.06
837E2: Village, moderately eroded-----	80	Very limited Slope Shrink-swell	1.00 0.06	Very limited Shrink-swell Slope	1.00 1.00	Very limited Slope Shrink-swell	1.00 0.06
838D: Allamakee-----	90	Very limited Shrink-swell Slope	1.00 0.63	Very limited Shrink-swell Slope	1.00 0.63	Very limited Slope Shrink-swell	1.00 1.00
838E: Allamakee-----	90	Very limited Shrink-swell Slope	1.00 1.00	Very limited Shrink-swell Slope	1.00 1.00	Very limited Slope Shrink-swell	1.00 1.00
840E: Lacrescent-----	75	Very limited Content of large stones Slope	1.00 0.63	Very limited Content of large stones Slope	1.00 0.63	Very limited Content of large stones Slope	1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
840G: Lacrescent-----	75	Very limited Slope Content of large stones	1.00 1.00	Very limited Slope Content of large stones	1.00 1.00	Very limited Slope Content of large stones	1.00 1.00
841G: Boone-----	65	Very limited Slope	1.00	Very limited Slope Depth to soft bedrock	1.00 0.46	Very limited Slope	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
861F: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
903C: Frankville-----	75	Very limited Shrink-swell Depth to hard bedrock	1.00 0.46	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.88 0.46
903D2: Frankville, moderately eroded--	75	Somewhat limited Slope Depth to hard bedrock	0.63 0.46	Very limited Depth to hard bedrock Slope	1.00 1.00 0.63	Very limited Slope Depth to hard bedrock	1.00 0.46
903E2: Frankville, moderately eroded--	75	Very limited Slope Depth to hard bedrock	1.00 0.46	Very limited Depth to hard bedrock Slope	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.46
912F: Paintcreek-----	95	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell	1.00 1.00
914B: Winneshiek-----	85	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.46
914C: Winneshiek-----	75	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Slope Depth to hard bedrock	0.88 0.46

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
914D: Winneshiek-----	80	Somewhat limited Slope Depth to hard bedrock	0.63 0.46	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Slope Depth to hard bedrock	1.00 0.46
914E: Winneshiek-----	80	Very limited Slope Depth to hard bedrock	1.00 0.46	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.46
926: Canoe, rarely flooded-----	95	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
965C2: Dubuque, moderately eroded-----	55	Somewhat limited Shrink-swell Depth to hard bedrock	0.50 0.46	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Somewhat limited Slope Shrink-swell Depth to hard bedrock	0.88 0.50 0.46
Fayette, moderately eroded-----	40	Somewhat limited Shrink-swell Slope	0.01 0.01	Somewhat limited Shrink-swell Slope	0.01 0.01	Very limited Slope Shrink-swell	1.00 0.01
965D2: Dubuque, moderately eroded-----	50	Somewhat limited Slope Depth to hard bedrock	0.63 0.46	Very limited Depth to hard bedrock Slope	1.00 0.63	Very limited Slope Depth to hard bedrock	1.00 0.46
Fayette, moderately eroded-----	30	Somewhat limited Slope Shrink-swell	0.63 0.01	Somewhat limited Slope Shrink-swell	0.63 0.01	Very limited Slope Shrink-swell	1.00 0.01
965E2: Dubuque, moderately eroded-----	50	Very limited Slope Depth to hard bedrock	1.00 0.46	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.46
Fayette, moderately eroded-----	30	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965G:							
Dubuque-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.46	Shrink-swell	0.50	Depth to hard bedrock	0.46
Fayette-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Shrink-swell	0.01	Shrink-swell	0.01	Shrink-swell	0.01
978:							
Festina-----	100	Not limited		Not limited		Not limited	
978B:							
Festina-----	100	Not limited		Not limited		Not limited	
1026:							
Bearpen, rarely flooded-----	80	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1084:							
Bearpen, rarely flooded, overwash--	50	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Lawson, rarely flooded, overwash--	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1152:							
Marshan, rarely flooded-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1489B:							
Lawson, frequently flooded-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ossian, frequently flooded-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1763E2: Fayette, moderately eroded-----	50	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01	Very limited Slope Shrink-swell	1.00 0.01
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1936: Udifluvents, channeled, frequently flooded	50	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
Spillville, channeled, frequently flooded	35	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Waukee-----	35	Not limited		Not limited		Not limited	
2551: Calamine-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone	1.00
Jacwin-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2671: Ion, occasionally flooded-----	65	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
Eitzen, occasionally flooded-----	35	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080: Udorthents-----	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	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Somewhat limited Low strength Frost action	0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
41: Sparta-----	100	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.07
41B: Sparta-----	100	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.07
41D: Sparta-----	100	Somewhat limited Slope	0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Slope Droughty	0.16 0.07
63B: Chelsea-----	85	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.28
63D: Chelsea-----	75	Somewhat limited Slope	0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Droughty Slope	0.28 0.16
84: Clyde-----	75	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
85: Eitzen, occasionally flooded-----	75	Very limited Frost action Flooding Low strength	1.00 1.00 1.00	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
98: Huntsville, occasionally flooded-----	100	Very limited Frost action Flooding Low strength	1.00 1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
98B: Huntsville, occasionally flooded-----	100	Very limited Frost action Flooding Low strength	1.00 1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
109B: Backbone-----	80	Somewhat limited Frost action Depth to hard bedrock	0.50 0.46	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Somewhat limited Depth to bedrock Droughty	0.46 0.02
109C: Backbone-----	75	Somewhat limited Frost action Depth to hard bedrock	0.50 0.46	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Somewhat limited Depth to bedrock Droughty	0.46 0.02
109D: Backbone-----	80	Somewhat limited Slope Frost action Depth to hard bedrock	0.63 0.50 0.46	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.63 0.10	Somewhat limited Slope Depth to bedrock Droughty	0.63 0.46 0.02
135: Coland, occasionally flooded-----	90	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
136B: Ankeny-----	100	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
162B: Downs-----	100	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.06	Somewhat limited Cutbanks cave	0.10	Not limited	
162C: Downs-----	95	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.06	Somewhat limited Cutbanks cave	0.10	Not limited	
162D: Downs-----	80	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
162E2: Downs, moderately eroded-----	80	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
163B: Fayette-----	100	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.01	Somewhat limited Cutbanks cave	0.10	Not limited	
163C2: Fayette, moderately eroded-----	90	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.01	Somewhat limited Cutbanks cave	0.10	Not limited	
163D2: Fayette, moderately eroded-----	80	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
163E2: Fayette, moderately eroded-----	75	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
163F: Fayette-----	80	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
163G: Fayette-----	95	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
175B: Dickinson-----	85	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
177C2: Saude, moderately eroded-----	90	Not limited		Very limited Cutbanks cave	1.00	Not limited	
178: Waukee-----	85	Not limited		Very limited Cutbanks cave	1.00	Not limited	

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
178B: Waukee-----	75	Not limited		Very limited Cutbanks cave	1.00	Not limited	
196: Volney, occasionally flooded-----	95	Very limited Flooding Content of large stones	1.00 0.18	Somewhat limited Flooding Dense layer Content of large stones	0.60 0.50 0.18	Somewhat limited Content of large stones Flooding	0.92 0.60
196+: Volney, occasionally flooded, overwash--	95	Very limited Flooding Content of large stones	1.00 0.02	Somewhat limited Flooding Dense layer Cutbanks cave	0.60 0.50 0.10	Somewhat limited Flooding	0.60
196B: Volney, rarely flooded-----	95	Somewhat limited Flooding Content of large stones	0.40 0.18	Somewhat limited Dense layer Content of large stones Cutbanks cave	0.50 0.18 0.10	Somewhat limited Content of large stones	0.92
198B: Floyd-----	90	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
221: Klossner-----	75	Very limited Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Content of organic matter Cutbanks cave	1.00 1.00 1.00 0.10	Very limited Depth to saturated zone	1.00
221+: Klossner, occasionally flooded, overwash--	95	Very limited Depth to saturated zone Subsidence Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Content of organic matter Flooding	1.00 1.00 1.00 0.60	Very limited Depth to saturated zone Flooding	1.00 0.60
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone Low strength Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
235: Coland, occasionally flooded-----	25	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
241B: Lilah-----	70	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.88
Dickinson-----	20	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
241C: Lilah-----	60	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.88
Dickinson-----	25	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
241D: Lilah-----	60	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Droughty Slope	0.88 0.63
Dickinson-----	40	Somewhat limited Slope Frost action	0.63 0.50	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Slope	0.63
285B: Burkhardt-----	75	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.52
285F: Burkhardt-----	75	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.52
291B: Atterberry-----	100	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
302B: Coggon-----	80	Somewhat limited Low strength Frost action Depth to saturated zone	0.78 0.50 0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Somewhat limited Depth to saturated zone	0.19
302C: Coggon-----	75	Somewhat limited Low strength Frost action Depth to saturated zone	0.78 0.50 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Somewhat limited 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
302C2: Coggon, moderately eroded-----	80	Somewhat limited Low strength Frost action Depth to saturated zone	0.78 0.50 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to saturated zone	0.19
320: Arenzville, occasionally flooded-----	100	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
391B: Clyde-----	45	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
Floyd-----	40	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
394B: Ostrander-----	80	Somewhat limited Frost action	0.50	Somewhat limited Dense layer Cutbanks cave	0.50 0.10	Not limited	
394C: Ostrander-----	85	Somewhat limited Frost action	0.50	Somewhat limited Dense layer Cutbanks cave	0.50 0.10	Not limited	
395B: Marquis-----	100	Somewhat limited Frost action Depth to saturated zone	0.50 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to saturated zone	0.19
444: Jacwin-----	80	Very limited Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.72 0.10	Very limited Depth to saturated zone	1.00
444B: Jacwin-----	75	Very limited Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.72 0.10	Very limited Depth to saturated zone	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
444C: Jacwin-----	75	Very limited Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.72 0.10	Very limited Depth to saturated zone	1.00
468B: Dunkerton-----	70	Very limited Depth to saturated zone Low strength Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
471: Oran-----	80	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
471B: Oran-----	90	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
480B: Orwood-----	100	Very limited Low strength Frost action	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
480C2: Orwood, moderately eroded-----	100	Very limited Low strength Frost action	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
480D2: Orwood, moderately eroded-----	85	Very limited Low strength Slope Frost action	1.00 0.63 0.50	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
480E2: Orwood, moderately eroded-----	85	Very limited Slope Low strength Frost action	1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope Low strength Frost action	1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
480F2: Orwood, moderately eroded-----	85	Very limited Slope Low strength Frost action	1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
482B: Racine-----	80	Very limited Low strength Frost action Shrink-swell	1.00 0.50 0.01	Somewhat limited Dense layer Cutbanks cave	0.50 0.10	Not limited	
484: Lawson, occasionally flooded-----	90	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
485: Spillville, occasionally flooded-----	100	Very limited Depth to saturated zone Flooding Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
487B: Otter, frequently flooded-----	50	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 1.00
Worthen-----	40	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
489: Ossian, occasionally flooded-----	95	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
491D2: Renova, moderately eroded-----	80	Somewhat limited Slope Frost action	0.63 0.50	Somewhat limited Slope Dense layer Cutbanks cave	0.63 0.50 0.10	Somewhat limited 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
491E2: Renova, moderately eroded-----	85	Very limited Slope Frost action	1.00 0.50	Very limited Slope Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Slope	1.00
499D: Nordness-----	75	Very limited Depth to hard bedrock Low strength Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.63 0.10	Very limited Depth to bedrock Slope Droughty	1.00 0.63 0.57
499G: Nordness-----	75	Very limited Depth to hard bedrock Low strength Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.57
512B: Marlean-----	90	Somewhat limited Content of large stones	0.12	Somewhat limited Content of large stones Cutbanks cave	0.12 0.10	Somewhat limited Content of large stones	0.08
512C: Marlean-----	75	Somewhat limited Content of large stones	0.29	Somewhat limited Content of large stones Cutbanks cave	0.29 0.10	Somewhat limited Content of large stones	0.08
512C2: Marlean, moderately eroded-----	75	Somewhat limited Content of large stones	0.29	Somewhat limited Content of large stones Cutbanks cave	0.29 0.10	Somewhat limited Content of large stones	0.08
512D2: Marlean, moderately eroded-----	75	Somewhat limited Content of large stones Slope	0.29 0.16	Somewhat limited Content of large stones Slope Cutbanks cave	0.29 0.16 0.10	Somewhat limited Slope Content of large stones	0.16 0.08
512E2: Marlean, moderately eroded-----	80	Very limited Slope Content of large stones	1.00 0.29	Very limited Slope Content of large stones Cutbanks cave	1.00 0.29 0.10	Very limited Slope Content of large stones	1.00 0.08

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
582B: Kasson-----	85	Somewhat limited Frost action Low strength Depth to saturated zone	 0.50 0.22 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	 1.00 0.50 0.10	Somewhat limited Depth to saturated zone	 0.19
582C: Kasson-----	95	Somewhat limited Frost action Low strength Depth to saturated zone	 0.50 0.22 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	 1.00 0.50 0.10	Somewhat limited Depth to saturated zone	 0.19
582C2: Kasson, moderately eroded-----	85	Somewhat limited Frost action Low strength Depth to saturated zone	 0.50 0.22 0.19	Very limited Depth to saturated zone Dense layer Cutbanks cave	 1.00 0.50 0.10	Somewhat limited Depth to saturated zone	 0.19
626: Hayfield-----	75	Very limited Depth to saturated zone Frost action	 1.00 1.00	Very limited Cutbanks cave Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone	 1.00
762B: Downs-----	55	Very limited Frost action Low strength Shrink-swell	 1.00 1.00 0.06	Somewhat limited Cutbanks cave	 0.10	Not limited	
Tama-----	45	Very limited Frost action Low strength Shrink-swell	 1.00 1.00 0.01	Somewhat limited Cutbanks cave	 0.10	Not limited	
762C: Downs-----	50	Very limited Frost action Low strength Shrink-swell	 1.00 1.00 0.06	Somewhat limited Cutbanks cave	 0.10	Not limited	
Tama-----	50	Very limited Frost action Low strength Shrink-swell	 1.00 1.00 0.01	Somewhat limited Cutbanks cave	 0.10	Not limited	
775B: Billett-----	100	Somewhat limited Frost action	 0.50	Very limited Cutbanks cave	 1.00	Not limited	
775C: Billett-----	90	Somewhat limited Frost action	 0.50	Very limited Cutbanks cave	 1.00	Not limited	

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
775D: Billett-----	90	Somewhat limited Slope Frost action	0.63 0.50	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Slope	0.63
782B: Donnan-----	90	Very limited Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Dense layer Too clayey	1.00 0.50 0.41	Very limited Depth to saturated zone	1.00
793: Bertrand-----	85	Very limited Frost action Low strength	1.00 1.00	Very limited Cutbanks cave	1.00	Not limited	
793B: Bertrand-----	100	Very limited Frost action Low strength	1.00 1.00	Very limited Cutbanks cave	1.00	Not limited	
806B: Whalan-----	80	Very limited Low strength Frost action Depth to hard bedrock	1.00 0.50 0.46	Very limited Depth to hard bedrock Too clayey	1.00 0.28	Somewhat limited Depth to bedrock	0.46
806C2: Whalan, moderately eroded-----	80	Very limited Low strength Frost action Depth to hard bedrock	1.00 0.50 0.46	Very limited Depth to hard bedrock Too clayey	1.00 0.28	Somewhat limited Depth to bedrock	0.46
806D: Whalan-----	80	Very limited Low strength Slope Frost action	1.00 0.63 0.50	Very limited Depth to hard bedrock Slope Too clayey	1.00 0.63 0.28	Somewhat limited Slope Depth to bedrock	0.63 0.46
813B: Atkinson-----	55	Very limited Low strength Frost action Shrink-swell	1.00 0.50 0.32	Somewhat limited Depth to hard bedrock Too clayey Cutbanks cave	0.64 0.12 0.10	Not limited	
814: Rockton-----	95	Somewhat limited Frost action Depth to hard bedrock Low strength	0.50 0.46 0.22	Very limited Depth to hard bedrock Cutbanks cave Too clayey	1.00 0.10 0.01	Somewhat limited Depth to bedrock	0.46

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
814B: Rockton-----	85	Somewhat limited Frost action Depth to hard bedrock Low strength	0.50 0.46 0.22	Very limited Depth to hard bedrock Cutbanks cave Too clayey	1.00 0.10 0.01	Somewhat limited Depth to bedrock	0.46
814C: Rockton-----	85	Somewhat limited Frost action Depth to hard bedrock Low strength	0.50 0.46 0.22	Very limited Depth to hard bedrock Cutbanks cave Too clayey	1.00 0.10 0.01	Somewhat limited Depth to bedrock	0.46
814D: Rockton-----	75	Somewhat limited Slope Frost action Depth to hard bedrock	0.63 0.50 0.46	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.63 0.10	Somewhat limited Slope Depth to bedrock	0.63 0.46
837D2: Village, moderately eroded-----	75	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Very limited Too clayey Slope Cutbanks cave	0.97 0.63 0.10	Somewhat limited Slope	0.63
837E2: Village, moderately eroded-----	80	Very limited Frost action Slope Low strength	1.00 1.00 1.00	Very limited Slope Too clayey Cutbanks cave	1.00 0.97 0.10	Very limited Slope	1.00
838D: Allamakee-----	90	Very limited Shrink-swell Frost action Low strength	1.00 1.00 1.00	Very limited Too clayey Slope Cutbanks cave	1.00 0.63 0.10	Somewhat limited Slope	0.63
838E: Allamakee-----	90	Very limited Shrink-swell Frost action Low strength	1.00 1.00 1.00	Very limited Slope Too clayey Cutbanks cave	1.00 1.00 0.10	Very limited Slope	1.00
840E: Lacrescent-----	75	Very limited Content of large stones Slope Frost action	1.00 0.63 0.50	Very limited Content of large stones Slope Cutbanks cave	1.00 0.63 0.10	Very limited Content of large stones Slope	1.00 0.63
840G: Lacrescent-----	75	Very limited Slope Content of large stones Frost action	1.00 1.00 0.50	Very limited Slope Content of large stones Cutbanks cave	1.00 1.00 0.10	Very limited Slope Content of large stones	1.00 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
841G: Boone-----	65	Very limited Slope	1.00	Very limited Cutbanks cave Slope Depth to soft bedrock	1.00 1.00 0.46	Very limited Slope Droughty Depth to bedrock	1.00 0.85 0.46
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 1.00 0.10	Very limited Slope	1.00
861F: Yellowriver-----	95	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 1.00 0.10	Very limited Slope	1.00
903C: Frankville-----	75	Very limited Shrink-swell Frost action Low strength	1.00 1.00 1.00	Very limited Depth to hard bedrock Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Somewhat limited Depth to bedrock	0.46
903D2: Frankville, moderately eroded--	75	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Too clayey	1.00 1.00 0.63 0.28	Somewhat limited Slope Depth to bedrock	0.63 0.46
903E2: Frankville, moderately eroded--	75	Very limited Frost action Slope Low strength	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Too clayey	1.00 1.00 1.00 0.28	Very limited Slope Depth to bedrock	1.00 0.46
912F: Paintcreek-----	95	Very limited Slope Frost action Shrink-swell	1.00 1.00 1.00	Very limited Slope Too clayey Cutbanks cave	1.00 0.92 0.10	Very limited Slope	1.00
914B: Winneshiek-----	85	Somewhat limited Frost action Depth to hard bedrock	0.50 0.46	Very limited Depth to hard bedrock Too clayey	1.00 1.00 0.28	Somewhat limited Depth to bedrock	0.46

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

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
914C: Winneshiek-----	75	Somewhat limited Frost action Depth to hard bedrock	0.50 0.46	Very limited Depth to hard bedrock Too clayey	1.00 0.28	Somewhat limited Depth to bedrock	0.46
914D: Winneshiek-----	80	Somewhat limited Slope Frost action Depth to hard bedrock	0.63 0.50 0.46	Very limited Depth to hard bedrock Slope Too clayey	1.00 0.63 0.28	Somewhat limited Slope Depth to bedrock	0.63 0.46
914E: Winneshiek-----	80	Very limited Slope Frost action Depth to hard bedrock	1.00 0.50 0.46	Very limited Depth to hard bedrock Slope Too clayey	1.00 1.00 0.28	Very limited Slope Depth to bedrock	1.00 0.46
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
965C2: Dubuque, moderately eroded-----	55	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to hard bedrock Too clayey Cutbanks cave	1.00 0.28 0.10	Somewhat limited Depth to bedrock	0.46
Fayette, moderately eroded-----	40	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
965D2: Dubuque, moderately eroded-----	50	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Too clayey	1.00 0.63 0.28	Somewhat limited Slope Depth to bedrock	0.63 0.46
Fayette, moderately eroded-----	30	Very limited Frost action Low strength Slope	1.00 1.00 0.63	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited 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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965E2: Dubuque, moderately eroded-----	50	Very limited Frost action Slope Low strength	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Too clayey	1.00 1.00 1.00 0.28	Very limited Slope Depth to bedrock	1.00 0.46
Fayette, moderately eroded-----	30	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
965G: Dubuque-----	55	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Too clayey	1.00 1.00 1.00 0.28	Very limited Slope Depth to bedrock	1.00 0.46
Fayette-----	40	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
978: Festina-----	100	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
978B: Festina-----	100	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	1.00
Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone Frost action Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Depth to saturated zone	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 0.40	Very limited Cutbanks cave Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
1489B: Lawson, frequently flooded-----	55	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 1.00
Ossian, frequently flooded-----	40	Very limited Depth to saturated zone Frost action Flooding	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 1.00
1763E2: Fayette, moderately eroded-----	50	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Frost action Low strength Slope	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Exette, moderately eroded-----	45	Very limited Slope Frost action Low strength	1.00 1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
1936: Udifuvents, channeled, frequently flooded	50	Very limited Flooding Frost action	1.00 0.50	Very limited Cutbanks cave Flooding Depth to saturated zone	1.00 0.80 0.61	Very limited Flooding	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1936: Spillville, channeled, frequently flooded	35	Very limited Depth to saturated zone Flooding Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Depth to saturated zone Flooding Low strength	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
Waukee-----	35	Not limited		Very limited Cutbanks cave	1.00	Not limited	
2551: Calamine-----	50	Very limited Depth to saturated zone Low strength Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Too clayey	1.00 0.10 0.03	Very limited Depth to saturated zone	1.00
Jacwin-----	35	Very limited Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.72 0.10	Very limited Depth to saturated zone	1.00
2671: Ion, occasionally flooded-----	65	Very limited Frost action Flooding Low strength	1.00 1.00 0.78	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
Eitzen, occasionally flooded-----	35	Very limited Frost action Flooding Low strength	1.00 1.00 1.00	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080: Udorthents-----	100	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		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
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	

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

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Somewhat limited Depth to saturated zone	0.99	Somewhat limited Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage Slope	0.50 0.32
41: Sparta-----	100	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage	1.00
41B: Sparta-----	100	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.32
41D: Sparta-----	100	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 1.00
63B: Chelsea-----	85	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.32
63D: Chelsea-----	75	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 1.00
84: Clyde-----	75	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
85: Eitzen, occasionally flooded-----	75	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
98: Huntsville, occasionally flooded-----	100	Very limited Flooding Slow water movement	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
98B: Huntsville, occasionally flooded-----	100	Very limited Flooding Slow water movement	1.00 0.50	Very limited Flooding Seepage Slope	1.00 0.50 0.32
109B: Backbone-----	80	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.32
109C: Backbone-----	75	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
109D: Backbone-----	80	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
135: Coland, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
136B: Ankeny-----	100	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
162B: Downs-----	100	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
162C: Downs-----	95	Somewhat limited Slow water movement	0.50	Very limited Slope Seepage	1.00 0.50
162D: Downs-----	80	Somewhat limited Slope Slow water movement	0.63 0.50	Very limited Slope Seepage	1.00 0.50
162E2: Downs, moderately eroded-----	80	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
163B: Fayette-----	100	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
163C2: Fayette, moderately eroded-----	90	Somewhat limited Slow water movement	0.50	Very limited Slope Seepage	1.00 0.50
163D2: Fayette, moderately eroded-----	80	Somewhat limited Slope Slow water movement	0.63 0.50	Very limited Slope Seepage	1.00 0.50
163E2: Fayette, moderately eroded-----	75	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
163F: Fayette-----	80	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
163G: Fayette-----	95	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
175B: Dickinson-----	85	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
177C2: Saude, moderately eroded-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 1.00
178: Waukee-----	85	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
178B: Waukee-----	75	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage Slope	1.00 0.08
196: Volney, occasionally flooded-----	95	Very limited Flooding Seepage, bottom layer Content of large stones	1.00 1.00 0.18	Very limited Flooding Seepage Content of large stones	1.00 1.00 0.22
196+: Volney, occasionally flooded, overwash--	95	Very limited Flooding Seepage, bottom layer Content of large stones	1.00 1.00 0.02	Very limited Flooding Seepage	1.00 1.00
196B: Volney, rarely flooded-----	95	Very limited Seepage, bottom layer Flooding Content of large stones	1.00 0.40 0.18	Very limited Seepage Flooding Content of large stones	1.00 0.40 0.22
198B: Floyd-----	90	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
221: Klossner-----	75	Very limited Depth to saturated zone Subsidence Slow water movement	1.00 1.00 0.68	Very limited Depth to saturated zone Seepage Content of organic matter	1.00 1.00 1.00
221+: Klossner, occasionally flooded, overwash--	95	Very limited Flooding Depth to saturated zone Subsidence	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone Seepage, bottom layer Slow water movement	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage Flooding	1.00 0.50 0.40
Coland, occasionally flooded-----	25	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
241B: Lilah-----	70	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
Dickinson-----	20	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.08
241C: Lilah-----	60	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 1.00
Dickinson-----	25	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
241D: Lilah-----	60	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.63	Very limited Slope Seepage	1.00 1.00
Dickinson-----	40	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 0.63	Very limited Slope Seepage	1.00 1.00
285B: Burkhardt-----	75	Very limited Filtering capacity Seepage, bottom layer	1.00 1.00	Very limited Seepage Slope	1.00 0.32
285F: Burkhardt-----	75	Very limited Filtering capacity Seepage, bottom layer Slope	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00
291B: Atterberry-----	100	Very limited Depth to saturated zone Slow water movement	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 0.50
302B: Coggon-----	80	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.08
302C: Coggon-----	75	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.50
302C2: Coggon, moderately eroded-----	80	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Slope	1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
320: Arenzville, occasionally flooded-----	100	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
391B: Clyde-----	45	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Floyd-----	40	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.08
394B: Ostrander-----	80	Very limited Slow water movement	1.00	Somewhat limited Seepage Slope	0.50 0.32
394C: Ostrander-----	85	Very limited Slow water movement	1.00	Somewhat limited Slope Seepage	0.92 0.50
395B: Marquis-----	100	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.32
444: Jacwin-----	80	Very limited Slow water movement Depth to saturated zone Depth to bedrock	1.00 1.00 0.99	Very limited Depth to saturated zone Depth to soft bedrock Seepage	1.00 0.99 0.50
444B: Jacwin-----	75	Very limited Slow water movement Depth to saturated zone Depth to bedrock	1.00 1.00 0.99	Very limited Depth to saturated zone Depth to soft bedrock Seepage	1.00 0.99 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
444C: Jacwin-----	75	Very limited Slow water movement Depth to saturated zone Depth to bedrock	1.00 1.00 0.99	Very limited Depth to saturated zone Slope Depth to soft bedrock	1.00 1.00 0.99
468B: Dunkerton-----	70	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.32
471: Oran-----	80	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
471B: Oran-----	90	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.08
480B: Orwood-----	100	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
480C2: Orwood, moderately eroded-----	100	Somewhat limited Slow water movement	0.50	Very limited Slope Seepage	1.00 0.50
480D2: Orwood, moderately eroded-----	85	Somewhat limited Slope Slow water movement	0.63 0.50	Very limited Slope Seepage	1.00 0.50
480E2: Orwood, moderately eroded-----	85	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
480E3: Orwood, severely eroded-----	90	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
480F2: Orwood, moderately eroded-----	85	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
482B: Racine-----	80	Very limited Slow water movement	1.00	Somewhat limited Seepage Slope	0.50 0.08
484: Lawson, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
485: Spillville, occasionally flooded-----	100	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
487B: Otter, frequently flooded-----	50	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Worthen-----	40	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.08
489: Ossian, occasionally flooded-----	95	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
491D2: Renova, moderately eroded-----	80	Very limited Slow water movement Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
491E2: Renova, moderately eroded-----	85	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.50
499D: Nordness-----	75	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
499G: Nordness-----	75	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00 1.00
512B: Marlean-----	90	Very limited Seepage, bottom layer Filtering capacity Content of large stones	1.00 1.00 0.12	Very limited Seepage Slope Content of large stones	1.00 0.32 0.04
512C: Marlean-----	75	Very limited Seepage, bottom layer Filtering capacity Content of large stones	1.00 1.00 0.29	Very limited Seepage Slope Content of large stones	1.00 1.00 0.14
512C2: Marlean, moderately eroded-----	75	Very limited Seepage, bottom layer Filtering capacity Content of large stones	1.00 1.00 0.29	Very limited Seepage Slope Content of large stones	1.00 1.00 0.14
512D2: Marlean, moderately eroded-----	75	Very limited Seepage, bottom layer Filtering capacity Content of large stones	1.00 1.00 0.29	Very limited Slope Seepage Content of large stones	1.00 1.00 0.14

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
512E2: Marlean, moderately eroded-----	80	Very limited Seepage, bottom layer Slope Filtering capacity	1.00 1.00 1.00	Very limited Slope Seepage Content of large stones	1.00 1.00 0.14
582B: Kasson-----	85	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.32
582C: Kasson-----	95	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Slope Seepage	1.00 1.00 0.50
582C2: Kasson, moderately eroded-----	85	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Slope	1.00 1.00
626: Hayfield-----	75	Very limited Depth to saturated zone Seepage, bottom layer Slow water movement	1.00 1.00 0.50	Very limited Seepage Depth to saturated zone	1.00 1.00
762B: Downs-----	55	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
Tama-----	45	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
762C: Downs-----	50	Somewhat limited Slow water movement	0.50	Very limited Slope Seepage	1.00 0.50
Tama-----	50	Somewhat limited Slow water movement	0.50	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
775B: Billett-----	100	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 0.32
775C: Billett-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 1.00
775D: Billett-----	90	Very limited Seepage, bottom layer Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
782B: Donnan-----	90	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.32
793: Bertrand-----	85	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
793B: Bertrand-----	100	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage Slope	1.00 0.32
806B: Whalan-----	80	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.08
806C2: Whalan, moderately eroded-----	80	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
806D: Whalan-----	80	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
813B: Atkinson-----	55	Somewhat limited Depth to bedrock Slow water movement	0.87 0.50	Very limited Seepage Depth to hard bedrock Slope	1.00 0.64 0.08
814: Rockton-----	95	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage	1.00 1.00
814B: Rockton-----	85	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.08
814C: Rockton-----	85	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
814D: Rockton-----	75	Very limited Depth to bedrock Slope Slow water movement	1.00 0.63 0.50	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
837D2: Village, moderately eroded-----	75	Very limited Slow water movement Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50
837E2: Village, moderately eroded-----	80	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.50
838D: Allamakee-----	90	Very limited Slow water movement Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50
838E: Allamakee-----	90	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
840E: Lacrescent-----	75	Very limited Seepage, bottom layer Content of large stones Slope	1.00 1.00 0.63	Very limited Seepage Content of large stones Slope	1.00 1.00 1.00
840G: Lacrescent-----	75	Very limited Slope Seepage, bottom layer Content of large stones	1.00 1.00 1.00	Very limited Slope Seepage Content of large stones	1.00 1.00 1.00
841G: Boone-----	65	Very limited Slope Seepage, bottom layer Depth to bedrock	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
861F: Yellowriver-----	95	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
903C: Frankville-----	75	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
903D2: Frankville, moderately eroded--	75	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
903E2: Frankville, moderately eroded--	75	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
912F: Paintcreek-----	95	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.50
914B: Winneshiek-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.32
914C: Winneshiek-----	75	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
914D: Winneshiek-----	80	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
914E: Winneshiek-----	80	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone Slow water movement Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.50 0.40
965C2: Dubuque, moderately eroded-----	55	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
Fayette, moderately eroded-----	40	Somewhat limited Slow water movement Slope	0.50 0.01	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
965D2: Dubuque, moderately eroded-----	50	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
Fayette, moderately eroded-----	30	Somewhat limited Slope Slow water movement	0.63 0.50	Very limited Slope Seepage	1.00 0.50
965E2: Dubuque, moderately eroded-----	50	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
Fayette, moderately eroded-----	30	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
965G: Dubuque-----	55	Very limited Slow water movement Slope Depth to bedrock	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
Fayette-----	40	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
978: Festina-----	100	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Somewhat limited Seepage	0.50
978B: Festina-----	100	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone Slow water movement Flooding	1.00 0.46 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.53 0.40
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone Slow water movement Flooding	1.00 0.46 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.53 0.40
Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone Slow water movement Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.50 0.40
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone Seepage, bottom layer Slow water movement	1.00 1.00 0.99	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40
1489B: Lawson, frequently flooded-----	55	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Ossian, frequently flooded-----	40	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
1763E2: Fayette, moderately eroded-----	50	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1763E2: Exette, moderately eroded-----	45	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
Exette, moderately eroded-----	45	Very limited Slope Slow water movement	1.00 0.50	Very limited Slope Seepage	1.00 0.50
1936: Udifluvents, channeled, frequently flooded	50	Very limited Flooding Seepage, bottom layer Depth to saturated zone	1.00 1.00 0.99	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 0.71
Spillville, channeled, frequently flooded	35	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
2486: Spillville, occasionally flooded-----	50	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
Waukee-----	35	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2551: Calamine-----	50	Very limited Slow water movement Depth to saturated zone Depth to bedrock	1.00 1.00 0.78	Very limited Depth to saturated zone Seepage Depth to soft bedrock	1.00 0.50 0.42
Jacwin-----	35	Very limited Slow water movement Depth to saturated zone Depth to bedrock	1.00 1.00 0.99	Very limited Depth to saturated zone Depth to soft bedrock Seepage	1.00 0.99 0.50
2671: Ion, occasionally flooded-----	65	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
Eitzen, occasionally flooded-----	35	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
5010: Pits, sand and gravel-----	100	Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated	
5040, 5080: Udorthents-----	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	

Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
41: Sparta-----	100	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
41B: Sparta-----	100	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
41D: Sparta-----	100	Very limited Seepage, bottom layer Too sandy Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Too sandy Seepage Slope	1.00 1.00 0.16
63B: Chelsea-----	85	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Very limited Seepage	1.00
63D: Chelsea-----	75	Very limited Seepage, bottom layer Slope	1.00 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Seepage Slope	1.00 0.16
84: Clyde-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
85: Eitzen, occasionally flooded-----	75	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
98: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
98B: Huntsville, occasionally flooded-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
109B: Backbone-----	80	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Seepage	1.00 0.50
109C: Backbone-----	75	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Seepage	1.00 0.50
109D: Backbone-----	80	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope Seepage	1.00 0.63 0.50
135: Coland, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
136B: Ankeny-----	100	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
162B: Downs-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
162C: Downs-----	95	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
162D: Downs-----	80	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
162E2: Downs, moderately eroded-----	80	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
163B: Fayette-----	100	Not limited		Not limited		Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163C2: Fayette, moderately eroded-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
163D2: Fayette, moderately eroded-----	80	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
163E2: Fayette, moderately eroded-----	75	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
163F: Fayette-----	80	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
163G: Fayette-----	95	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
175B: Dickinson-----	85	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
177C2: Saude, moderately eroded-----	90	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
178: Waukee-----	85	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
178B: Waukee-----	75	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
196: Volney, occasionally flooded-----	95	Very limited Flooding Seepage, bottom layer Content of large stones	1.00 1.00 0.84	Very limited Flooding Seepage	1.00 1.00	Very limited Seepage Content of large stones	1.00 0.84

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
196+: Volney, occasionally flooded, overwash--	95	Very limited Flooding Seepage, bottom layer Content of large stones	1.00 1.00 0.69	Very limited Flooding Seepage	1.00 1.00	Very limited Seepage Content of large stones	1.00 0.69
196B: Volney, rarely flooded-----	95	Very limited Seepage, bottom layer Content of large stones Flooding	1.00 0.84 0.40	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Content of large stones	1.00 0.84
198B: Floyd-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
221: Klossner-----	75	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
221+: Klossner, occasionally flooded, overwash--	95	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
235: Turlin, rarely flooded-----	55	Very limited Depth to saturated zone Seepage, bottom layer Flooding	1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
Coland, occasionally flooded-----	25	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
241B:							
Lilah-----	70	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
Dickinson-----	20	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
241C:							
Lilah-----	60	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
Dickinson-----	25	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
241D:							
Lilah-----	60	Very limited Seepage, bottom layer Slope Too sandy	1.00 0.63 0.50	Very limited Seepage Slope	1.00 0.63	Very limited Seepage Slope Too sandy	1.00 0.63 0.50
Dickinson-----	40	Very limited Seepage, bottom layer Too sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too sandy Seepage Slope	1.00 1.00 0.63
285B:							
Burkhardt-----	75	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage Gravel content	1.00 1.00 0.01
285F:							
Burkhardt-----	75	Very limited Seepage, bottom layer Too sandy Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00	Very limited Too sandy Seepage Slope	1.00 1.00 1.00
291B:							
Atterberry-----	100	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
302B:							
Coggon-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
302C: Coggon-----	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
302C2: Coggon, moderately eroded-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
320: Arenzville, occasionally flooded-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
391B: Clyde-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
Floyd-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
394B: Ostrander-----	80	Not limited		Not limited		Not limited	
394C: Ostrander-----	85	Not limited		Not limited		Not limited	
395B: Marquis-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
444: Jacwin-----	80	Very limited Depth to saturated zone Depth to bedrock Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.99	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
444B: Jacwin-----	75	Very limited Depth to saturated zone Depth to bedrock Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.99	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
444C: Jacwin-----	75	Very limited Depth to saturated zone Depth to bedrock Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.99	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
468B: Dunkerton-----	70	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
471: Oran-----	80	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
471B: Oran-----	90	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
480B: Orwood-----	100	Not limited		Not limited		Not limited	
480C2: Orwood, moderately eroded-----	100	Not limited		Not limited		Not limited	
480D2: Orwood, moderately eroded-----	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63
480E2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
480F2: Orwood, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
482B: Racine-----	80	Not limited		Not limited		Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
484: Lawson, occasionally flooded-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
485: Spillville, occasionally flooded-----	100	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
487B: Otter, frequently flooded-----	50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Worthen-----	40	Not limited		Not limited		Not limited	
489: Ossian, occasionally flooded-----	95	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
491D2: Renova, moderately eroded-----	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63
491E2: Renova, moderately eroded-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
499D: Nordness-----	75	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63
499G: Nordness-----	75	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Seepage Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
512B: Marlean-----	90	Very limited Seepage, bottom layer Content of large stones	1.00 0.32	Very limited Seepage	1.00	Very limited Seepage Content of large stones Gravel content	1.00 0.32 0.01
512C: Marlean-----	75	Very limited Seepage, bottom layer Content of large stones	1.00 0.62	Very limited Seepage	1.00	Very limited Seepage Content of large stones	1.00 0.62
512C2: Marlean, moderately eroded-----	75	Very limited Seepage, bottom layer Content of large stones	1.00 0.62	Very limited Seepage	1.00	Very limited Seepage Content of large stones	1.00 0.62
512D2: Marlean, moderately eroded-----	75	Very limited Seepage, bottom layer Content of large stones Slope	1.00 0.62 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Seepage Content of large stones Slope	1.00 0.62 0.16
512E2: Marlean, moderately eroded-----	80	Very limited Seepage, bottom layer Slope Content of large stones	1.00 1.00 0.62	Very limited Seepage Slope	1.00 1.00	Very limited Slope Seepage Content of large stones	1.00 1.00 0.62
582B: Kasson-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
582C: Kasson-----	95	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86
582C2: Kasson, moderately eroded-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.86

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
626: Hayfield-----	75	Very limited Depth to saturated zone Seepage, bottom layer Too sandy	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00
762B: Downs-----	55	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Tama-----	45	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
762C: Downs-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Tama-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
775B: Billett-----	100	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
775C: Billett-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
775D: Billett-----	90	Very limited Seepage, bottom layer Slope	1.00 0.63	Very limited Seepage Slope	1.00 0.63	Somewhat limited Slope Seepage	0.63 0.50
782B: Donnan-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
793: Bertrand-----	85	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
793B: Bertrand-----	100	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
806B: Whalan-----	80	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Too clayey	1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
806C2: Whalan, moderately eroded-----	80	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
806D: Whalan-----	80	Very limited Depth to bedrock Slope Too clayey	1.00 0.63 0.50	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope Too clayey	1.00 0.63 0.50
813B: Atkinson-----	55	Very limited Depth to bedrock Too clayey	1.00 0.50	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock Too clayey	0.65 0.50
814: Rockton-----	95	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock	1.00
814B: Rockton-----	85	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock	1.00
814C: Rockton-----	85	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock	1.00
814D: Rockton-----	75	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63
837D2: Village, moderately eroded-----	75	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
837E2: Village, moderately eroded-----	80	Very limited Slope Too clayey	1.00 1.00	Very limited Slope	1.00	Very limited Slope Too clayey Hard to compact	1.00 1.00 1.00
838D: Allamakee-----	90	Very limited Too clayey Slope	1.00 0.63	Somewhat limited Slope	0.63	Very limited Too clayey Hard to compact Slope	1.00 1.00 0.63

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
838E: Allamakee-----	90	Very limited Too clayey Slope	1.00 1.00	Very limited Slope	1.00	Very limited Too clayey Hard to compact Slope	1.00 1.00 1.00
840E: Lacrescent-----	75	Very limited Seepage, bottom layer Content of large Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Content of large Slope Seepage	1.00 0.63 0.50
840G: Lacrescent-----	75	Very limited Slope Seepage, bottom layer Content of large	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Content of large Seepage	1.00 1.00 0.50
841G: Boone-----	65	Very limited Slope Depth to bedrock Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage Depth to bedrock	1.00 1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
861F: Yellowriver-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
903C: Frankville-----	75	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Too clayey Hard to compact Depth to bedrock	1.00 1.00 1.00
903D2: Frankville, moderately eroded--	75	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63
903E2: Frankville, moderately eroded--	75	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Seepage Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
912F: Paintcreek-----	95	Very limited Slope Too clayey	1.00 1.00	Very limited Slope	1.00	Very limited Slope Too clayey Hard to compact	1.00 1.00 1.00
914B: Winneshiek-----	85	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Seepage	1.00 1.00
914C: Winneshiek-----	75	Very limited Depth to bedrock	1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock	1.00
914D: Winneshiek-----	80	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63
914E: Winneshiek-----	80	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Seepage Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
926: Canoe, rarely flooded-----	95	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
965C2: Dubuque, moderately eroded-----	55	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
Fayette, moderately eroded-----	40	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
965D2: Dubuque, moderately eroded-----	50	Very limited Depth to bedrock Slope	1.00 0.63	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.63	Very limited Depth to bedrock Slope	1.00 0.63
Fayette, moderately eroded-----	30	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965E2: Dubuque, moderately eroded-----	50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Seepage Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
Fayette, moderately eroded-----	30	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
965G: Dubuque-----	55	Very limited Slope Depth to bedrock Too clayey	1.00 1.00 0.50	Very limited Slope Seepage Depth to bedrock	1.00 1.00 1.00	Very limited Slope Depth to bedrock Too clayey	1.00 1.00 0.50
Fayette-----	40	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
978: Festina-----	100	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
978B: Festina-----	100	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
1026: Bearpen, rarely flooded-----	80	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
1084: Bearpen, rarely flooded, overwash--	50	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
Lawson, rarely flooded, overwash--	40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone	1.00
1152: Marshan, rarely flooded-----	75	Very limited Depth to saturated zone Too sandy Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1489B: Lawson, frequently flooded-----	55	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Ossian, frequently flooded-----	40	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
1763E2: Fayette, moderately eroded-----	50	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Exette, moderately eroded-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1936: Udfluvents, channeled, frequently flooded	50	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Seepage	1.00
Spillville, channeled, frequently flooded	35	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2486: Spillville, occasionally flooded-----	50	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Depth to saturated zone	1.00
Waukee-----	35	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
2551: Calamine-----	50	Very limited Depth to saturated zone Depth to bedrock Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.42	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
Jacwin-----	35	Very limited Depth to saturated zone Depth to bedrock Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.99	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
2671: Ion, occasionally flooded-----	65	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
Eitzen, occasionally flooded-----	35	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040: Udorthents-----	100	Not rated		Not rated		Not rated	
5080: Udorthents-----	100	Not rated		Somewhat limited Slope	0.96	Not rated	
AW: Animal waste lagoon	100	Not rated		Not rated		Not rated	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SL: Sewage lagoon-----	100	Not rated		Not rated		Not rated	
W: Water-----	100	Not rated		Not rated		Not rated	

Construction Materials

The titles of the tables described in this section are:

- “Source of Sand and Gravel”
- “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 Sand and Gravel,” 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 Sand and Gravel

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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
27B:					
Terril-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
41:					
Sparta-----	100	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.27
		Bottom layer	0.00	Bottom layer	0.35
41B:					
Sparta-----	100	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.27
		Bottom layer	0.00	Bottom layer	0.35
41D:					
Sparta-----	100	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.27
		Bottom layer	0.00	Bottom layer	0.35
63B:					
Chelsea-----	85	Improbable		Fair	
		Thickest layer	0.00	Bottom layer	0.12
		Bottom layer	0.00	Thickest layer	0.12
63D:					
Chelsea-----	75	Improbable		Fair	
		Thickest layer	0.00	Bottom layer	0.12
		Bottom layer	0.00	Thickest layer	0.12
84:					
Clyde-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
85:					
Eitzen, occasionally flooded-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
98:					
Huntsville, occasionally flooded-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
98B: Huntsville, occasionally flooded-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
109B: Backbone-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
109C: Backbone-----	75	Improbable Thickest layer Bottom layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.06
109D: Backbone-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.06
135: Coland, occasionally flooded-----	90	Improbable Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.03
136B: Ankeny-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.05
162B: Downs-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
162C: Downs-----	95	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
162D: Downs-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
162E2: Downs, moderately eroded-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
163B: Fayette-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Source of Sand and Gravel--Continued

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
163C2: Fayette, moderately eroded-----	90	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
163D2: Fayette, moderately eroded-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
163E2: Fayette, moderately eroded-----	75	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
163F: Fayette-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
163G: Fayette-----	95	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
175B: Dickinson-----	85	Improbable Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.36
177C2: Saude, moderately eroded-----	90	Possible Thickest layer Bottom layer	0.00 0.04	Fair Thickest layer Bottom layer	0.00 0.59
178: Waukee-----	85	Possible Thickest layer Bottom layer	0.00 0.04	Fair Thickest layer Bottom layer	0.00 0.68
178B: Waukee-----	75	Possible Thickest layer Bottom layer	0.00 0.04	Fair Thickest layer Bottom layer	0.00 0.68
196: Volney, occasionally flooded-----	95	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
196+: Volney, occasionally flooded, overwash--	95	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Source of Sand and Gravel--Continued

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
196B: Volney, rarely flooded-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
198B: Floyd-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
221: Klossner-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
221+: Klossner, occasionally flooded, overwash--	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
235: Turlin, rarely flooded-----	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Coland, occasionally flooded-----	25	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.03
241B: Lilah-----	70	Improbable		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.10
Dickinson-----	20	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.36
241C: Lilah-----	60	Improbable		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.10
Dickinson-----	25	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.36
241D: Lilah-----	60	Improbable		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.10
Dickinson-----	40	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.36

Source of Sand and Gravel--Continued

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
285B: Burkhardt-----	75	Possible		Fair	
		Thickest layer	0.00	Thickest layer	0.69
		Bottom layer	0.01	Bottom layer	0.99
285F: Burkhardt-----	75	Possible		Fair	
		Thickest layer	0.00	Thickest layer	0.69
		Bottom layer	0.01	Bottom layer	0.99
291B: Atterberry-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
302B: Coggon-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
302C: Coggon-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
302C2: Coggon, moderately eroded-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
320: Arenzville, occasionally flooded-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
391B: Clyde-----	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Floyd-----	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
394B: Ostrander-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
394C: Ostrander-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
395B: Marquis-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
444: Jacwin-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
444B: Jacwin-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
444C: Jacwin-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
468B: Dunkerton-----	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
471: Oran-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
471B: Oran-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
480B: Orwood-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
480C2: Orwood, moderately eroded-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
480D2: Orwood, moderately eroded-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
480E2: Orwood, moderately eroded-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
480E3: Orwood, severely eroded-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
480F2: Orwood, moderately eroded-----	85	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
482B: Racine-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
484: Lawson, occasionally flooded-----	90	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
485: Spillville, occasionally flooded-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
487B: Otter, frequently flooded-----	50	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Worthen-----	40	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
489: Ossian, occasionally flooded-----	95	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
491D2: Renova, moderately eroded-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
491E2: Renova, moderately eroded-----	85	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
499D: Nordness-----	75	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
499G: Nordness-----	75	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Source of Sand and Gravel--Continued

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
512B: Marlean-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
512C: Marlean-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
512C2: Marlean, moderately eroded-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
512D2: Marlean, moderately eroded-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
512E2: Marlean, moderately eroded-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
582B: Kasson-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
582C: Kasson-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
582C2: Kasson, moderately eroded-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
626: Hayfield-----	75	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.54
762B: Downs-----	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Tama-----	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
762C:					
Downs-----	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Tama-----	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
775B:					
Billett-----	100	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.00	Bottom layer	0.08
775C:					
Billett-----	90	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.00	Bottom layer	0.08
775D:					
Billett-----	90	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.00	Bottom layer	0.08
782B:					
Donnan-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
793:					
Bertrand-----	85	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.82
793B:					
Bertrand-----	100	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.82
806B:					
Whalan-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
806C2:					
Whalan, moderately eroded-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
806D:					
Whalan-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
813B:					
Atkinson-----	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
814: Rockton-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
814B: Rockton-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
814C: Rockton-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
814D: Rockton-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
837D2: Village, moderately eroded-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
837E2: Village, moderately eroded-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
838D: Allamakee-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
838E: Allamakee-----	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
840E: Lacrescent-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
840G: Lacrescent-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
841G: Boone-----	65	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.04
		Bottom layer	0.00	Bottom layer	0.11
Rock outcrop-----	20	Not rated		Not rated	

Source of Sand and Gravel--Continued

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
861E: Yellowriver-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
861F: Yellowriver-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
903C: Frankville-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
903D2: Frankville, moderately eroded--	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
903E2: Frankville, moderately eroded--	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
912F: Paintcreek-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
914B: Winneshiek-----	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
914C: Winneshiek-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
914D: Winneshiek-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
914E: Winneshiek-----	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
926: Canoe, rarely flooded-----	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

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
965C2: Dubuque, moderately eroded-----	55	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fayette, moderately eroded-----	40	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
965D2: Dubuque, moderately eroded-----	50	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fayette, moderately eroded-----	30	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
965E2: Dubuque, moderately eroded-----	50	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fayette, moderately eroded-----	30	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
965G: Dubuque-----	55	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fayette-----	40	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
978: Festina-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
978B: Festina-----	100	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
1026: Bearpen, rarely flooded-----	80	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Source of Sand and Gravel--Continued

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
1084:					
Bearpen, rarely flooded, overwash--	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Lawson, rarely flooded, overwash--	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1152:					
Marshan, rarely flooded-----	75	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.29
		Bottom layer	0.00	Bottom layer	0.82
1489B:					
Lawson, frequently flooded-----	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Ossian, frequently flooded-----	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1763E2:					
Fayette, moderately eroded-----	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Exette, moderately eroded-----	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1763F2:					
Fayette, moderately eroded-----	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Exette, moderately eroded-----	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1936:					
Udifluvents, channeled, frequently flooded	50	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.46

Source of Sand and Gravel--Continued

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
1936: Spillville, channeled, frequently flooded	35	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
2486: Spillville, occasionally flooded-----	50	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Waukee-----	35	Possible Thickest layer Bottom layer	0.00 0.04	Fair Thickest layer Bottom layer	0.00 0.68
2551: Calamine-----	50	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Jacwin-----	35	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
2671: Ion, occasionally flooded-----	65	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Eitzen, occasionally flooded-----	35	Improbable Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
5010: Pits, sand and gravel-----	100	Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated	
5040, 5080: Udorthents-----	100	Not rated		Not rated	
AW: Animal waste lagoon	100	Not rated		Not rated	
SL: Sewage lagoon-----	100	Not rated		Not rated	

Source of Sand and Gravel--Continued

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
W: Water-----	100	Not rated		Not rated	

Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Good		Fair Low strength	0.22	Good	
41: Sparta-----	100	Poor Too sandy Wind erosion Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy	0.00
41B: Sparta-----	100	Poor Too sandy Wind erosion Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy	0.00
41D: Sparta-----	100	Poor Too sandy Wind erosion Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy Slope	0.00 0.84
63B: Chelsea-----	85	Poor Too sandy Wind erosion Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy	0.00
63D: Chelsea-----	75	Poor Too sandy Wind erosion Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy Slope	0.00 0.84
84: Clyde-----	75	Fair Organic matter content Water erosion	0.12 0.99	Poor Wetness Shrink-swell	0.00 0.99	Poor Wetness	0.00
85: Eitzen, occasionally flooded-----	75	Fair Too acid	0.84	Poor Low strength	0.00	Good	

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
98: Huntsville, occasionally flooded-----	100	Fair Organic matter content	0.24	Poor Low strength	0.00	Good	
98B: Huntsville, occasionally flooded-----	100	Fair Organic matter content	0.24	Poor Low strength	0.00	Good	
109B: Backbone-----	80	Fair Droughty Depth to bedrock Too acid	0.16 0.54 0.74	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.54
109C: Backbone-----	75	Fair Droughty Depth to bedrock Too acid	0.16 0.54 0.74	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.54
109D: Backbone-----	80	Fair Droughty Depth to bedrock Too acid	0.16 0.54 0.74	Poor Depth to bedrock	0.00	Fair Slope Depth to bedrock	0.37 0.54
135: Coland, occasionally flooded-----	90	Fair Too clayey	0.98	Poor Wetness Low strength	0.00 0.00	Poor Wetness Too clayey	0.00 0.98
136B: Ankeny-----	100	Good		Good		Good	
162B: Downs-----	100	Fair Organic matter content Too acid Water erosion	0.88 0.88 0.90	Poor Low strength	0.00	Good	
162C: Downs-----	95	Fair Organic matter content Too acid Water erosion	0.88 0.88 0.90	Poor Low strength	0.00	Good	

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
162D: Downs-----	80	Fair		Poor		Fair	
		Organic matter content	0.88	Low strength	0.00	Slope	0.37
		Too acid	0.88				
		Water erosion	0.90				
162E2: Downs, moderately eroded-----	80	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.98	Slope	0.00
		Too acid	0.88				
		Water erosion	0.90				
163B: Fayette-----	100	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Too acid	0.68				
		Water erosion	0.90				
163C2: Fayette, moderately eroded-----	90	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Too acid	0.68				
		Water erosion	0.90				
163D2: Fayette, moderately eroded-----	80	Fair		Poor		Fair	
		Organic matter content	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.68				
		Water erosion	0.90				
163E2: Fayette, moderately eroded-----	75	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.98	Slope	0.00
		Too acid	0.68				
		Water erosion	0.90				
163F: Fayette-----	80	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.18	Slope	0.00
		Too acid	0.68				
		Water erosion	0.90				
163G: Fayette-----	95	Fair		Poor		Poor	
		Organic matter content	0.12	Slope Low strength	0.00 0.00	Slope	0.00
		Too acid	0.68				
		Water erosion	0.90				

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
175B: Dickinson-----	85	Fair		Good		Good	
		Organic matter content	0.12				
		Too acid	0.84				
		Droughty	0.95				
177C2: Saude, moderately eroded-----	90	Fair		Good		Fair	
		Organic matter content	0.12			Hard to reclaim (rock fragments)	0.82
		Too acid	0.74				
178: Waukee-----	85	Fair		Good		Fair	
		Organic matter content	0.12			Hard to reclaim (rock fragments)	0.98
		Too acid	0.74				
178B: Waukee-----	75	Fair		Good		Fair	
		Organic matter content	0.12			Hard to reclaim (rock fragments)	0.98
		Too acid	0.74				
196: Volney, occasionally flooded-----	95	Poor		Fair		Poor	
		Stone content	0.00	Stone content	0.19	Hard to reclaim (rock fragments)	0.00
		Organic matter content	0.50	Cobble content	0.85	Rock fragments	0.50
		Carbonate content	0.80			Carbonate content	0.80
196+: Volney, occasionally flooded, overwash--	95	Fair		Fair		Poor	
		Stone content	0.02	Stone content	0.52	Hard to reclaim (rock fragments)	0.00
		Organic matter content	0.50	Cobble content	0.97	Rock fragments	0.50
		Carbonate content	0.80				
196B: Volney, rarely flooded-----	95	Poor		Fair		Poor	
		Stone content	0.00	Stone content	0.19	Hard to reclaim (rock fragments)	0.00
		Organic matter content	0.50	Cobble content	0.85	Rock fragments	0.50
		Carbonate content	0.80			Carbonate content	0.80
198B: Floyd-----	90	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
221: Klossner-----	75	Poor Wind erosion Organic matter content Too acid	0.00 0.12 0.99	Poor Wetness Low strength	0.00 0.22	Poor Wetness Organic matter content	0.00 0.00
221+: Klossner, occasionally flooded, overwash--	95	Poor Wind erosion Organic matter content Too acid	0.00 0.12 0.99	Poor Wetness Low strength	0.00 0.22	Poor Wetness Organic matter content	0.00 0.00
235: Turlin, rarely flooded-----	55	Good		Poor Wetness Low strength	0.00 0.00	Poor Wetness	0.00
Coland, occasionally flooded-----	25	Fair Too clayey	0.98	Poor Wetness Low strength	0.00 0.00	Poor Wetness Too clayey	0.00 0.98
241B: Lilah-----	70	Poor Too sandy Droughty Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy Rock fragments Too acid	0.00 0.00 0.98
Dickinson-----	20	Fair Organic matter content Too acid Droughty	0.12 0.84 0.95	Good		Good	
241C: Lilah-----	60	Poor Too sandy Droughty Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy Rock fragments Too acid	0.00 0.00 0.98
Dickinson-----	25	Fair Organic matter content Too acid Droughty	0.12 0.84 0.95	Good		Good	
241D: Lilah-----	60	Poor Too sandy Droughty Organic matter content	0.00 0.00 0.12	Good		Poor Too sandy Rock fragments Slope	0.00 0.00 0.37

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
241D: Dickinson-----	40	Fair		Good		Fair	
		Organic matter content	0.12			Slope	0.37
		Too acid	0.84				
		Droughty	0.95				
285B: Burkhardt-----	75	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Droughty	0.09			Rock fragments	0.00
		Organic matter content	0.12			Hard to reclaim (rock fragments)	0.68
285F: Burkhardt-----	75	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.82	Too sandy	0.00
		Droughty	0.09			Slope	0.00
		Organic matter content	0.12			Rock fragments	0.00
291B: Atterberry-----	100	Fair		Poor		Poor	
		Organic matter content	0.18	Wetness	0.00	Wetness	0.00
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.97	Shrink-swell	0.99		
302B: Coggon-----	80	Fair		Fair		Fair	
		Organic matter content	0.12	Low strength	0.22	Wetness	0.53
		Too acid	0.54	Wetness	0.53		
302C: Coggon-----	75	Fair		Fair		Fair	
		Organic matter content	0.12	Low strength	0.22	Wetness	0.53
		Too acid	0.54	Wetness	0.53		
302C2: Coggon, moderately eroded-----	80	Fair		Fair		Fair	
		Organic matter content	0.12	Low strength	0.22	Wetness	0.53
		Too acid	0.54	Wetness	0.53		
320: Arenzville, occasionally flooded-----	100	Fair		Fair		Good	
		Water erosion	0.99	Low strength	0.78		
391B: Clyde-----	45	Fair		Poor		Poor	
		Water erosion	0.99	Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Shrink-swell	0.99		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
391B: Floyd-----	40	Good		Poor Wetness Low strength	0.00 0.00	Poor Wetness	0.00
394B: Ostrander-----	80	Fair Organic matter content Too acid	0.50 0.97	Good		Fair Rock fragments	0.97
394C: Ostrander-----	85	Fair Organic matter content Too acid	0.50 0.97	Good		Fair Rock fragments	0.97
395B: Marquis-----	100	Fair Organic matter content Too acid Water erosion	0.50 0.97 0.99	Fair Wetness	0.53	Fair Wetness	0.53
444: Jacwin-----	80	Poor Too clayey Organic matter content Carbonate content	0.00 0.50 0.97	Poor Wetness Low strength Depth to bedrock	0.00 0.00 0.00	Poor Too clayey Wetness	0.00 0.00
444B: Jacwin-----	75	Poor Too clayey Organic matter content Carbonate content	0.00 0.50 0.97	Poor Wetness Low strength Depth to bedrock	0.00 0.00 0.00	Poor Too clayey Wetness	0.00 0.00
444C: Jacwin-----	75	Poor Too clayey Organic matter content Carbonate content	0.00 0.50 0.97	Poor Wetness Low strength Depth to bedrock	0.00 0.00 0.00	Poor Too clayey Wetness	0.00 0.00
468B: Dunkerton-----	70	Fair Organic matter content Too acid Water erosion	0.12 0.97 0.99	Poor Wetness Low strength	0.00 0.22	Poor Wetness	0.00
471: Oran-----	80	Fair Organic matter content Too acid	0.50 0.68	Poor Wetness Low strength	0.00 0.00	Poor Wetness Rock fragments	0.00 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		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
471B: Oran-----	90	Fair		Poor		Poor	
		Organic matter content	0.50	Wetness	0.00	Wetness	0.00
		Too acid	0.68	Low strength	0.00	Rock fragments	0.97
480B: Orwood-----	100	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.97				
480C2: Orwood, moderately eroded-----	100	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.97				
480D2: Orwood, moderately eroded-----	85	Fair		Poor		Fair	
		Water erosion	0.90	Low strength	0.00	Slope	0.37
		Too acid	0.97				
480E2: Orwood, moderately eroded-----	85	Fair		Poor		Poor	
		Water erosion	0.90	Low strength	0.00	Slope	0.00
		Too acid	0.97	Slope	0.98		
480E3: Orwood, severely eroded-----	90	Fair		Poor		Poor	
		Water erosion	0.90	Low strength	0.00	Slope	0.00
		Too acid	0.97	Slope	0.98		
480F2: Orwood, moderately eroded-----	85	Fair		Poor		Poor	
		Water erosion	0.90	Low strength	0.00	Slope	0.00
		Too acid	0.97	Slope	0.32		
482B: Racine-----	80	Fair		Fair		Good	
		Organic matter content	0.12	Low strength	0.78		
		Too acid	0.68				
484: Lawson, occasionally flooded-----	90	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
485: Spillville, occasionally flooded-----	100	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
487B: Otter, frequently flooded-----	50	Fair Water erosion	0.90	Poor Wetness Low strength	0.00 0.22	Poor Wetness	0.00
Worthen-----	40	Fair Organic matter content Water erosion	0.68 0.90	Poor Low strength	0.00	Good	
489: Ossian, occasionally flooded-----	95	Good		Poor Wetness Low strength	0.00 0.00	Poor Wetness	0.00
491D2: Renova, moderately eroded-----	80	Fair Organic matter content Too acid Water erosion	0.12 0.54 0.99	Good		Fair Slope	0.37
491E2: Renova, moderately eroded-----	85	Fair Organic matter content Too acid Water erosion	0.12 0.54 0.99	Fair Slope	0.98	Poor Slope	0.00
499D: Nordness-----	75	Poor Depth to bedrock Droughty Organic matter content	0.00 0.00 0.88	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.73	Poor Depth to bedrock Slope	0.00 0.37
499G: Nordness-----	75	Poor Depth to bedrock Droughty Organic matter content	0.00 0.00 0.88	Poor Depth to bedrock Low strength Slope	0.00 0.00 0.00	Poor Depth to bedrock Slope	0.00 0.00
512B: Marlean-----	90	Fair Organic matter content Cobble content	0.02 0.92	Fair Cobble content	0.41	Poor Rock fragments Hard to reclaim (rock fragments)	0.00 0.00
512C: Marlean-----	75	Fair Organic matter content Cobble content	0.02 0.73	Fair Cobble content	0.15	Poor Rock fragments Hard to reclaim (rock fragments)	0.00 0.00

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
512C2: Marlean, moderately eroded-----	75	Fair		Fair		Poor	
		Organic matter content	0.02	Cobble content	0.15	Rock fragments Hard to reclaim (rock fragments)	0.00 0.00
		Cobble content	0.73				
512D2: Marlean, moderately eroded-----	75	Fair		Fair		Poor	
		Organic matter content	0.02	Cobble content	0.15	Rock fragments Hard to reclaim (rock fragments)	0.00 0.00
		Cobble content	0.73			Slope	0.84
512E2: Marlean, moderately eroded-----	80	Fair		Fair		Poor	
		Organic matter content	0.02	Cobble content	0.15	Rock fragments	0.00
		Cobble content	0.73	Slope	0.98	Slope	0.00
						Hard to reclaim (rock fragments)	0.00
582B: Kasson-----	85	Fair		Fair		Fair	
		Organic matter content	0.12	Wetness	0.53	Wetness	0.53
		Too acid	0.88	Low strength	0.78		
582C: Kasson-----	95	Fair		Fair		Fair	
		Organic matter content	0.12	Wetness	0.53	Wetness	0.53
		Too acid	0.88	Low strength	0.78		
582C2: Kasson, moderately eroded-----	85	Fair		Fair		Fair	
		Organic matter content	0.12	Wetness	0.53	Wetness	0.53
		Too acid	0.88	Low strength	0.78		
626: Hayfield-----	75	Fair		Poor		Poor	
		Organic matter content	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.74				
762B: Downs-----	55	Fair		Poor		Good	
		Organic matter content	0.88	Low strength	0.00		
		Too acid	0.88				
		Water erosion	0.90				
Tama-----	45	Fair		Poor		Good	
		Too acid	0.84	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.99		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
762C: Downs-----	50	Fair		Poor		Good	
		Organic matter content	0.88	Low strength	0.00		
		Too acid	0.88				
		Water erosion	0.90				
Tama-----	50	Fair		Poor		Good	
		Too acid	0.84	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.99		
775B: Billett-----	100	Fair		Good		Good	
		Organic matter content	0.12				
		Too acid	0.84				
775C: Billett-----	90	Fair		Good		Good	
		Organic matter content	0.12				
		Too acid	0.84				
775D: Billett-----	90	Fair		Good		Fair Slope	0.37
		Organic matter content	0.12				
		Too acid	0.84				
782B: Donnan-----	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter content	0.12	Low strength	0.00	Wetness	0.00
		Too acid	0.54	Shrink-swell	0.38		
793: Bertrand-----	85	Fair		Poor		Good	
		Organic matter content	0.50	Low strength	0.00		
		Too acid	0.84				
		Water erosion	0.99				
793B: Bertrand-----	100	Fair		Poor		Good	
		Organic matter content	0.50	Low strength	0.00		
		Too acid	0.84				
		Water erosion	0.99				
806B: Whalan-----	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.67	Low strength	0.00		
		Too acid	0.84				

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
806C2: Whalan, moderately eroded-----	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.67	Low strength	0.00		
		Too acid	0.84				
806D: Whalan-----	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.37
		Droughty	0.67	Low strength	0.00	Depth to bedrock	0.54
		Too acid	0.84				
813B: Atkinson-----	55	Fair		Poor		Fair	
		Too acid	0.74	Low strength	0.00	Rock fragments	0.97
				Depth to bedrock	0.35		
				Shrink-swell	0.95		
814: Rockton-----	95	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Too acid	0.84	Low strength	0.78		
		Organic matter content	0.88	Shrink-swell	0.98		
814B: Rockton-----	85	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Too acid	0.84	Low strength	0.78		
		Organic matter content	0.88	Shrink-swell	0.98		
814C: Rockton-----	85	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Too acid	0.84	Low strength	0.78		
		Organic matter content	0.88	Shrink-swell	0.98		
814D: Rockton-----	75	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.37
		Too acid	0.84	Low strength	0.78	Depth to bedrock	0.54
		Organic matter content	0.88	Shrink-swell	0.98		
837D2: Village, moderately eroded-----	75	Fair		Poor		Fair	
		Organic matter content	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.20	Shrink-swell	0.11		
		Water erosion	0.90				

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
837E2: Village, moderately eroded-----	80	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Too acid	0.20	Shrink-swell	0.11		
		Water erosion	0.90	Slope	0.98		
838D: Allamakee-----	90	Fair		Poor		Fair	
		Organic matter content	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.20	Shrink-swell	0.07	Hard to reclaim (rock fragments)	0.76
		Water erosion	0.90	Slope		Rock fragments	0.99
838E: Allamakee-----	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Organic matter content	0.12	Shrink-swell	0.07	Slope	0.00
		Too acid	0.20	Slope	0.98	Rock fragments	0.50
840E: Lacrescent-----	75	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content	0.12			Rock fragments	0.00
		Droughty	0.98			Slope	0.37
840G: Lacrescent-----	75	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Slope	0.00
		Organic matter content	0.12	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.98			Rock fragments	0.00
841G: Boone-----	65	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Slope	0.00
		Wind erosion	0.00	Slope	0.00	Too sandy	0.00
		Droughty	0.00			Depth to bedrock	0.54
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Slope	0.98		
861F: Yellowriver-----	95	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Slope	0.18		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
903C: Frankville-----	75	Fair		Poor		Fair	
		Depth to bedrock	0.54	Low strength	0.00	Depth to bedrock	0.54
		Water erosion	0.90	Depth to bedrock	0.00		
		Too acid	0.95	Shrink-swell	0.96		
903D2: Frankville, moderately eroded--	75	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.37
		Water erosion	0.90	Low strength	0.00	Depth to bedrock	0.54
		Too acid	0.95	Shrink-swell	0.96		
903E2: Frankville, moderately eroded--	75	Fair		Poor		Poor	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.00
		Water erosion	0.90	Low strength	0.00	Depth to bedrock	0.54
		Too acid	0.95	Shrink-swell	0.96		
912F: Paintcreek-----	95	Poor		Poor		Poor	
		Too clayey	0.00	Shrink-swell	0.00	Slope	0.00
		Organic matter content	0.12	Low strength	0.00	Too clayey	0.00
		Too acid	0.20	Slope	0.02	Hard to reclaim (rock fragments)	0.50
914B: Winneshiek-----	85	Fair		Poor		Fair	
		Droughty	0.45	Depth to bedrock	0.00	Depth to bedrock	0.54
		Depth to bedrock	0.54	Shrink-swell	0.99		
914C: Winneshiek-----	75	Fair		Poor		Fair	
		Droughty	0.45	Depth to bedrock	0.00	Depth to bedrock	0.54
		Depth to bedrock	0.54	Shrink-swell	0.99	Rock fragments	0.97
914D: Winneshiek-----	80	Fair		Poor		Fair	
		Droughty	0.45	Depth to bedrock	0.00	Slope	0.37
		Depth to bedrock	0.54	Shrink-swell	0.99	Depth to bedrock	0.54
						Rock fragments	0.97
914E: Winneshiek-----	80	Fair		Poor		Poor	
		Droughty	0.45	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.54	Slope	0.98	Depth to bedrock	0.54
				Shrink-swell	0.99	Rock fragments	0.97
926: Canoe, rarely flooded-----	95	Fair		Poor		Poor	
		Organic matter content	0.50	Wetness	0.00	Wetness	0.00
		Too acid	0.74	Low strength	0.00		
		Water erosion	0.90				

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965C2: Dubuque, moderately eroded-----	55	Fair		Poor		Fair	
		Organic matter content	0.50	Low strength	0.00	Depth to bedrock	0.54
		Depth to bedrock	0.54	Depth to bedrock	0.00	Too clayey	0.65
		Too acid	0.74	Shrink-swell	0.71		
Fayette, moderately eroded-----	40	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Too acid	0.68				
		Water erosion	0.90				
965D2: Dubuque, moderately eroded-----	50	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.37
		Too acid	0.74	Low strength	0.00	Depth to bedrock	0.54
		Droughty	0.90	Shrink-swell	0.91		
Fayette, moderately eroded-----	30	Fair		Poor		Fair	
		Organic matter content	0.12	Low strength	0.00	Slope	0.37
		Too acid	0.68				
		Water erosion	0.90				
965E2: Dubuque, moderately eroded-----	50	Fair		Poor		Poor	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.74	Low strength	0.00	Depth to bedrock	0.54
		Droughty	0.90	Shrink-swell	0.91		
Fayette, moderately eroded-----	30	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Too acid	0.68	Slope	0.98		
		Water erosion	0.90				
965G: Dubuque-----	55	Fair		Poor		Poor	
		Depth to bedrock	0.54	Low strength	0.00	Slope	0.00
		Too acid	0.74	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.90	Slope	0.50		
Fayette-----	40	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Too acid	0.68	Slope	0.50		
		Water erosion	0.90				

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
978: Festina-----	100	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Too acid	0.74				
		Water erosion	0.90				
978B: Festina-----	100	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Too acid	0.74				
		Water erosion	0.90				
1026: Bearpen, rarely flooded-----	80	Fair		Poor		Poor	
		Organic matter content	0.50	Wetness	0.00	Wetness	0.00
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.97				
1084: Bearpen, rarely flooded, overwash--	50	Fair		Poor		Poor	
		Organic matter content	0.50	Wetness	0.00	Wetness	0.00
		Water erosion	0.90	Low strength	0.00		
		Too acid	0.97				
Lawson, rarely flooded, overwash--	40	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
1152: Marshan, rarely flooded-----	75	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Too sandy	0.00
		Organic matter content	0.12			Wetness	0.00
						Hard to reclaim (rock fragments)	0.12
1489B: Lawson, frequently flooded-----	55	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
Ossian, frequently flooded-----	40	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1763E2: Fayette, moderately eroded-----	50	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.98	Slope	0.00
		Too acid	0.68				
		Water erosion	0.90				
Exette, moderately eroded-----	45	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.98	Slope	0.00
		Water erosion	0.90				
1763F2: Fayette, moderately eroded-----	50	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.18	Slope	0.00
		Too acid	0.68				
		Water erosion	0.90				
Exette, moderately eroded-----	45	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength Slope	0.00 0.18	Slope	0.00
		Water erosion	0.90				
1936: Udifluvents, channeled, frequently flooded	50	Fair		Good		Good	
		Organic matter content	0.12				
Spillville, channeled, frequently flooded	35	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
2486: Spillville, occasionally flooded-----	50	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
Waukee-----	35	Fair		Good		Fair	
		Organic matter content	0.12			Hard to reclaim (rock fragments)	0.98
		Too acid	0.74				
2551: Calamine-----	50	Fair		Poor		Poor	
		Water erosion	0.90	Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Depth to bedrock	0.58		

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

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2551: Jacwin-----	35	Poor Too clayey Organic matter content Carbonate content	0.00 0.50 0.97	Poor Wetness Low strength Depth to bedrock	0.00 0.00 0.00	Poor Too clayey Wetness	0.00 0.00
2671: Ion, occasionally flooded-----	65	Good		Fair Low strength	0.22	Good	
Eitzen, occasionally flooded-----	35	Fair Too acid	0.84	Poor Low strength	0.00	Good	
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040, 5080: Udorthents-----	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	

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

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. 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		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
27B: Terril-----	75	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.50	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10
41: Sparta-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.35	Very limited Depth to water	1.00
41B: Sparta-----	100	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.35	Very limited Depth to water	1.00
41D: Sparta-----	100	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.35	Very limited Depth to water	1.00
63B: Chelsea-----	85	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
63D: Chelsea-----	75	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
84: Clyde-----	75	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.09	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
85: Eitzen, occasionally flooded-----	75	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.62	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10
98: Huntsville, occasionally flooded-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.50	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
98B: Huntsville, occasionally flooded-----	100	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.50	Very limited Depth to water	1.00
109B: Backbone-----	80	Very limited Seepage Depth to bedrock Slope	1.00 0.86 0.08	Somewhat limited Thin layer Seepage	0.86 0.03	Very limited Depth to water	1.00
109C: Backbone-----	75	Very limited Seepage Slope Depth to bedrock	1.00 0.92 0.86	Somewhat limited Thin layer Seepage	0.86 0.06	Very limited Depth to water	1.00
109D: Backbone-----	80	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Seepage	0.86 0.06	Very limited Depth to water	1.00
135: Coland, occasionally flooded-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Seepage	1.00 0.13 0.03	Somewhat limited Cutbanks cave	0.10
136B: Ankeny-----	100	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.05	Very limited Depth to water	1.00
162B: Downs-----	100	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.20	Very limited Depth to water	1.00
162C: Downs-----	95	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.20	Very limited Depth to water	1.00
162D: Downs-----	80	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.20	Very limited Depth to water	1.00
162E2: Downs, moderately eroded-----	80	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.10	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
163B: Fayette-----	100	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.19	Very limited Depth to water	1.00
163C2: Fayette, moderately eroded-----	90	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
163D2: Fayette, moderately eroded-----	80	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
163E2: Fayette, moderately eroded-----	75	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
163F: Fayette-----	80	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
163G: Fayette-----	95	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
175B: Dickinson-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.36	Very limited Depth to water	1.00
177C2: Saude, moderately eroded-----	90	Very limited Seepage Slope	1.00 0.92	Somewhat limited Seepage	0.59	Very limited Depth to water	1.00
178: Waukee-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.68	Very limited Depth to water	1.00
178B: Waukee-----	75	Very limited Seepage	1.00	Somewhat limited Seepage	0.68	Very limited Depth to water	1.00
196: Volney, occasionally flooded-----	95	Very limited Seepage	1.00	Somewhat limited Content of large stones	0.18	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
196+: Volney, occasionally flooded, overwash--	95	Very limited Seepage	1.00	Somewhat limited Content of large stones	0.02	Very limited Depth to water	1.00
196B: Volney, rarely flooded-----	95	Very limited Seepage	1.00	Somewhat limited Content of large stones	0.18	Very limited Depth to water	1.00
198B: Floyd-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.62	Somewhat limited Cutbanks cave	0.10
221: Klossner-----	75	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Cutbanks cave	0.10
221+: Klossner, occasionally flooded, overwash--	95	Very limited Seepage	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Cutbanks cave	0.10
235: Turlin, rarely flooded-----	55	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.68	Somewhat limited Cutbanks cave	0.10
Coland, occasionally flooded-----	25	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Seepage	1.00 0.08 0.03	Somewhat limited Cutbanks cave	0.10
241B: Lilah-----	70	Very limited Seepage	1.00	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
Dickinson-----	20	Very limited Seepage	1.00	Somewhat limited Seepage	0.36	Very limited Depth to water	1.00
241C: Lilah-----	60	Very limited Seepage Slope	1.00 0.92	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
Dickinson-----	25	Very limited Seepage Slope	1.00 0.92	Somewhat limited Seepage	0.36	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
241D: Lilah-----	60	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
Dickinson-----	40	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.36	Very limited Depth to water	1.00
285B: Burkhardt-----	75	Very limited Seepage Slope	1.00 0.08	Very limited Seepage	0.99	Very limited Depth to water	1.00
285F: Burkhardt-----	75	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	0.99	Very limited Depth to water	1.00
291B: Atterberry-----	100	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.05	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
302B: Coggon-----	80	Not limited		Very limited Depth to saturated zone Piping	0.99 0.14	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
302C: Coggon-----	75	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Piping	0.99 0.16	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
302C2: Coggon, moderately eroded-----	80	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Piping	0.99 0.13	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
320: Arenzville, occasionally flooded-----	100	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
391B: Clyde-----	45	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.09	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Floyd-----	40	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.62	Somewhat limited Cutbanks cave	0.10
394B: Ostrander-----	80	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping Seepage	0.46 0.01	Very limited Depth to water	1.00
394C: Ostrander-----	85	Somewhat limited Seepage Slope	0.70 0.68	Somewhat limited Piping Seepage	0.46 0.01	Very limited Depth to water	1.00
395B: Marquis-----	100	Somewhat limited Seepage Slope	0.70 0.08	Very limited Depth to saturated zone Piping	0.99 0.47	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
444: Jacwin-----	80	Somewhat limited Seepage Depth to bedrock	0.70 0.01	Very limited Depth to saturated zone Thin layer	1.00 0.46	Very limited Depth to water	1.00
444B: Jacwin-----	75	Somewhat limited Seepage Slope Depth to bedrock	0.70 0.08 0.01	Very limited Depth to saturated zone Thin layer	1.00 0.46	Very limited Depth to water	1.00
444C: Jacwin-----	75	Somewhat limited Slope Seepage Depth to bedrock	0.92 0.70 0.01	Very limited Depth to saturated zone Thin layer	1.00 0.46	Very limited Depth to water	1.00
468B: Dunkerton-----	70	Very limited Seepage Slope	1.00 0.08	Very limited Depth to saturated zone Piping	1.00 0.37	Somewhat limited Cutbanks cave	0.10
471: Oran-----	80	Not limited		Very limited Depth to saturated zone Piping	1.00 0.11	Somewhat limited Slow refill Cutbanks cave	0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
471B: Oran-----	90	Not limited		Very limited Depth to saturated zone Piping	1.00 0.11	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
480B: Orwood-----	100	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.40	Very limited Depth to water	1.00
480C2: Orwood, moderately eroded-----	100	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.47	Very limited Depth to water	1.00
480D2: Orwood, moderately eroded-----	85	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.47	Very limited Depth to water	1.00
480E2: Orwood, moderately eroded-----	85	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.47	Very limited Depth to water	1.00
480E3: Orwood, severely eroded-----	90	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.40	Very limited Depth to water	1.00
480F2: Orwood, moderately eroded-----	85	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.47	Very limited Depth to water	1.00
482B: Racine-----	80	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.24	Very limited Depth to water	1.00
484: Lawson, occasionally flooded-----	90	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.76	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
485: Spillville, occasionally flooded-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.78	Somewhat limited Cutbanks cave	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
487B: Otter, frequently flooded-----	50	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.51	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Worthen-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
489: Ossian, occasionally flooded-----	95	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.22	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
491D2: Renova, moderately eroded-----	80	Very limited Slope	1.00	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
491E2: Renova, moderately eroded-----	85	Very limited Slope	1.00	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
499D: Nordness-----	75	Very limited Seepage Depth to bedrock Slope	1.00 1.00 1.00	Very limited Thin layer Piping	1.00 0.08	Very limited Depth to water	1.00
499G: Nordness-----	75	Very limited Seepage Slope Depth to bedrock	1.00 1.00 1.00	Very limited Thin layer Piping	1.00 0.08	Very limited Depth to water	1.00
512B: Marlean-----	90	Very limited Seepage Slope	1.00 0.08	Somewhat limited Content of large stones	0.12	Very limited Depth to water	1.00
512C: Marlean-----	75	Very limited Seepage Slope	1.00 0.92	Somewhat limited Content of large stones	0.29	Very limited Depth to water	1.00
512C2: Marlean, moderately eroded-----	75	Very limited Seepage Slope	1.00 0.92	Somewhat limited Content of large stones	0.29	Very limited Depth to water	1.00
512D2: Marlean, moderately eroded-----	75	Very limited Seepage Slope	1.00 1.00	Somewhat limited Content of large stones	0.29	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
512E2: Marlean, moderately eroded-----	80	Very limited Seepage Slope	1.00 1.00	Somewhat limited Content of large stones	0.29	Very limited Depth to water	1.00
582B: Kasson-----	85	Somewhat limited Seepage Slope	0.70 0.08	Very limited Depth to saturated zone Piping	0.99 0.42	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
582C: Kasson-----	95	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Piping	0.99 0.38	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
582C2: Kasson, moderately eroded-----	85	Somewhat limited Slope	0.92	Very limited Depth to saturated zone Piping	0.99 0.37	Very limited Slow refill Cutbanks cave Depth to saturated zone	1.00 0.10 0.01
626: Hayfield-----	75	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.54	Very limited Cutbanks cave	1.00
762B: Downs-----	55	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.20	Very limited Depth to water	1.00
Tama-----	45	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.04	Very limited Depth to water	1.00
762C: Downs-----	50	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.20	Very limited Depth to water	1.00
Tama-----	50	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.04	Very limited Depth to water	1.00
775B: Billett-----	100	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
775C: Billett-----	90	Very limited Seepage Slope	1.00 0.92	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
775D: Billett-----	90	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
782B: Donnan-----	90	Somewhat limited Seepage Slope	0.70 0.08	Very limited Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
793: Bertrand-----	85	Very limited Seepage	1.00	Somewhat limited Piping Seepage	0.83 0.82	Very limited Depth to water	1.00
793B: Bertrand-----	100	Very limited Seepage Slope	1.00 0.08	Somewhat limited Piping Seepage	0.83 0.82	Very limited Depth to water	1.00
806B: Whalan-----	80	Very limited Seepage Depth to bedrock	1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.53	Very limited Depth to water	1.00
806C2: Whalan, moderately eroded-----	80	Very limited Seepage Slope Depth to bedrock	1.00 0.92 0.86	Somewhat limited Thin layer Piping	0.86 0.50	Very limited Depth to water	1.00
806D: Whalan-----	80	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.53	Very limited Depth to water	1.00
813B: Atkinson-----	55	Very limited Seepage Depth to bedrock	1.00 0.17	Somewhat limited Thin layer Piping	0.17 0.02	Very limited Depth to water	1.00
814: Rockton-----	95	Very limited Seepage Depth to bedrock	1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.07	Very limited Depth to water	1.00
814B: Rockton-----	85	Very limited Seepage Depth to bedrock	1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.07	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
814C: Rockton-----	85	Very limited Seepage Slope Depth to bedrock	 1.00 0.92 0.86	Somewhat limited Thin layer Piping	 0.86 0.07	Very limited Depth to water	 1.00
814D: Rockton-----	75	Very limited Seepage Slope Depth to bedrock	 1.00 1.00 0.86	Somewhat limited Thin layer Piping	 0.86 0.07	Very limited Depth to water	 1.00
837D2: Village, moderately eroded-----	75	Very limited Slope Seepage	 1.00 0.70	Somewhat limited Hard to pack	 0.24	Very limited Depth to water	 1.00
837E2: Village, moderately eroded-----	80	Very limited Slope Seepage	 1.00 0.70	Somewhat limited Hard to pack	 0.22	Very limited Depth to water	 1.00
838D: Allamakee-----	90	Very limited Slope Seepage	 1.00 0.70	Somewhat limited Hard to pack	 0.27	Very limited Depth to water	 1.00
838E: Allamakee-----	90	Very limited Slope Seepage	 1.00 0.70	Somewhat limited Hard to pack	 0.27	Very limited Depth to water	 1.00
840E: Lacrescent-----	75	Very limited Seepage Slope	 1.00 1.00	Very limited Content of large stones	 1.00	Very limited Depth to water	 1.00
840G: Lacrescent-----	75	Very limited Seepage Slope	 1.00 1.00	Very limited Content of large stones	 1.00	Very limited Depth to water	 1.00
841G: Boone-----	65	Very limited Seepage Slope Depth to bedrock	 1.00 1.00 0.11	Somewhat limited Thin layer Seepage	 0.86 0.11	Very limited Depth to water	 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
861E: Yellowriver-----	95	Very limited Slope Seepage	 1.00 0.70	Somewhat limited Piping	 0.45	Very limited Depth to water	 1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
861F: Yellowriver-----	95	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.45	Very limited Depth to water	1.00
903C: Frankville-----	75	Very limited Seepage Slope Depth to bedrock	1.00 0.92 0.86	Somewhat limited Thin layer Piping	0.86 0.25	Very limited Depth to water	1.00
903D2: Frankville, moderately eroded--	75	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.25	Very limited Depth to water	1.00
903E2: Frankville, moderately eroded--	75	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.25	Very limited Depth to water	1.00
912F: Paintcreek-----	95	Very limited Slope	1.00	Somewhat limited Hard to pack	0.89	Very limited Depth to water	1.00
914B: Winneshiek-----	85	Very limited Seepage Depth to bedrock Slope	1.00 0.86 0.08	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
914C: Winneshiek-----	75	Very limited Seepage Slope Depth to bedrock	1.00 0.92 0.86	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
914D: Winneshiek-----	80	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
914E: Winneshiek-----	80	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
926: Canoe, rarely flooded-----	95	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.36	Somewhat limited Slow refill Cutbanks cave	0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
965C2: Dubuque, moderately eroded-----	55	Very limited Seepage Slope Depth to bedrock	1.00 0.92 0.86	Somewhat limited Thin layer Piping	0.86 0.01	Very limited Depth to water	1.00
Fayette, moderately eroded-----	40	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
965D2: Dubuque, moderately eroded-----	50	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.11	Very limited Depth to water	1.00
Fayette, moderately eroded-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
965E2: Dubuque, moderately eroded-----	50	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.11	Very limited Depth to water	1.00
Fayette, moderately eroded-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
965G: Dubuque-----	55	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.86	Somewhat limited Thin layer Piping	0.86 0.11	Very limited Depth to water	1.00
Fayette-----	40	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.18	Very limited Depth to water	1.00
978: Festina-----	100	Very limited Seepage	1.00	Somewhat limited Piping	0.62	Very limited Depth to water	1.00
978B: Festina-----	100	Very limited Seepage Slope	1.00 0.08	Somewhat limited Piping	0.62	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1026: Bearpen, rarely flooded-----	80	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone Piping	1.00 0.83	Somewhat limited Slow refill Cutbanks cave	0.28 0.10
1084: Bearpen, rarely flooded, overwash--	50	Somewhat limited Seepage	0.72	Very limited Depth to saturated zone Piping	1.00 0.83	Somewhat limited Slow refill Cutbanks cave	0.28 0.10
Lawson, rarely flooded, overwash--	40	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.76	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
1152: Marshan, rarely flooded-----	75	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.82	Very limited Cutbanks cave	1.00
1489B: Lawson, frequently flooded-----	55	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.76	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Ossian, frequently flooded-----	40	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.22	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
1763E2: Fayette, moderately eroded-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
Exette, moderately eroded-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.74	Very limited Depth to water	1.00
1763F2: Fayette, moderately eroded-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.09	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1763F2: Exette, moderately eroded-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.74	Very limited Depth to water	1.00
1936: Udifluvents, channeled, frequently flooded	50	Very limited Seepage	1.00	Somewhat limited Seepage	0.46	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
Spillville, channeled, frequently flooded	35	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.78	Somewhat limited Cutbanks cave	0.10
2486: Spillville, occasionally flooded-----	50	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 0.72	Somewhat limited Cutbanks cave	0.10
Waukee-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.68	Very limited Depth to water	1.00
2551: Calamine-----	50	Somewhat limited Seepage Depth to bedrock	0.70 0.01	Very limited Depth to saturated zone Thin layer	1.00 0.11	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Jacwin-----	35	Somewhat limited Seepage Depth to bedrock	0.70 0.01	Very limited Depth to saturated zone Thin layer	1.00 0.46	Very limited Depth to water	1.00
2671: Ion, occasionally flooded-----	65	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10
Eitzen, occasionally flooded-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.66	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5010: Pits, sand and gravel-----	100	Not rated		Not rated		Not rated	
5030: Pits, limestone quarries-----	100	Not rated		Not rated		Not rated	
5040: Udorthents-----	100	Not rated		Not rated		Not rated	
5080: Udorthents-----	100	Very limited Slope	1.00	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	

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

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

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		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
27B: Terril-----	0-8	Loam	CL	A-7-6, A-6	0	0	100	95-100	85-95	55-75	34-44	11-18
	8-36	Clay loam, loam	SC, CL	A-7-6, A-2-4, A-6	0	0	100	90-100	65-95	35-85	30-48	9-21
	36-60	Clay loam, loam	SC, CL	A-7-6, A-2-4, A-6	0	0	100	90-100	65-95	35-85	24-42	9-21
41: Sparta-----	0-8	Sand, fine sand, loamy sand, loamy fine sand	SC-SM, SP-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-25	NP-6
	8-15	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-22	NP-6
	15-72	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-20	NP-4
	72-80	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-1-b	0	0	95-100	90-100	50-95	2-20	0-17	NP-2
41B: Sparta-----	0-8	Sand, fine sand, loamy sand, loamy fine sand	SC-SM, SP-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-25	NP-6
	8-15	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-22	NP-6
	15-72	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-20	NP-4
	72-80	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-1-b	0	0	95-100	90-100	50-95	2-20	0-17	NP-2
41D: Sparta-----	0-8	Sand, fine sand, loamy sand, loamy fine sand	SC-SM, SP-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-25	NP-6
	8-15	Sand, fine sand, loamy sand, loamy fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-22	NP-6
	15-72	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SC-SM, SM	A-2-4, A-1-b	0	0	95-100	90-100	50-95	5-35	0-20	NP-4
	72-80	Sand, fine sand	SP-SM, SM, SP	A-2-4, A-1-b	0	0	95-100	90-100	50-95	2-20	0-17	NP-2
63B: Chelsea-----	0-8	Fine sand, loamy fine sand	SC, SC-SM, SP-SC	A-2-4	0	0	100	100	65-80	10-35	20-28	4-9
	8-36	Loamy fine sand, fine sand	SC-SM, SP, SP-SC	A-2-4	0	0	100	100	65-85	3-15	16-21	2-6
	36-70	Loamy fine sand, fine sandy loam, loamy sand, fine sand, sandy loam	SC-SM, SP, SP-SC	A-2-4	0	0	100	100	65-85	3-15	16-21	2-6

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
63D: Chelsea-----	0-8	Fine sand, loamy fine sand	SC, SC-SM, SP-SC	A-2-4	0	0	100	100	65-80	10-35	20-28	4-9
	8-32	Loamy fine sand, fine sand	SC-SM, SP, SP-SC	A-2-4	0	0	100	100	65-85	3-15	16-21	2-6
	32-70	Fine sand, sandy loam, loamy fine sand, fine sandy loam, loamy sand	SC-SM, SP, SP-SC	A-2-4	0	0	100	100	65-85	3-15	16-21	2-6
84: Clyde-----	0-8	Clay loam, silty clay loam, loam, silt loam	MH, ML	A-7-6, A-7-5	0	0-5	95-100	95-100	80-90	55-75	42-61	13-22
	8-17	Silty clay loam, clay loam	CL, MH, ML	A-7-5, A-7-6	0	0-5	95-100	95-100	80-90	55-75	42-54	19-22
	17-23	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-90	55-75	40-50	19-22
	23-28	Clay loam, silty clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	75-90	50-75	32-44	15-21
	28-41	Clay loam, silty clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	75-90	50-75	32-44	15-21
	41-44	Sandy loam, loam	SC, SC-SM	A-1-b, A-2-4	0	2-5	85-95	85-95	50-80	15-35	21-27	6-9
	44-62	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	29-39	13-19
	62-66	Clay loam, loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	29-39	13-19
85: Eitzen, occasionally flooded-----	0-8	Silt loam	CL	A-6, A-7-6	0	0	100	98-100	92-100	75-100	32-43	12-17
	8-25	Stratified silt loam	CL	A-6	0	0	100	98-100	92-100	75-100	29-39	12-17
	25-48	Silt loam	ML, CL	A-6, A-7-6	0	0	100	98-100	92-100	85-95	32-45	12-18
	48-55	Silt loam, loam	CL	A-6, A-7-6	0	0	100	90-100	85-100	80-95	29-41	12-19
	55-60	Loam, silt loam	CL	A-6, A-7-6	0	0	100	90-100	85-100	80-95	29-41	12-19
98: Huntsville, occasionally flooded-----	0-8	Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	90-100	85-100	34-45	11-18
	8-27	Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	90-100	85-100	34-45	11-18
	27-52	Silt loam	CL	A-6	0	0	100	100	90-100	85-100	28-38	12-19
	52-60	Silt loam	CL	A-6	0	0	100	100	90-100	85-100	28-38	12-19

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
98B: Huntsville, occasionally flooded-----	0-8	Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	90-100	85-100	34-45	11-18
	8-27	Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	90-100	85-100	34-45	11-18
	27-52	Silt loam	CL	A-6	0	0	100	100	90-100	85-100	28-38	12-19
	52-60	Silt loam	CL	A-6	0	0	100	100	90-100	85-100	28-38	12-19
109B: Backbone-----	0-8	Sandy loam	SC, SC-SM	A-6, A-2-4	0	0	100	100	75-85	15-40	21-32	4-12
	8-17	Sandy loam, loamy sand	SC-SM, SC	A-6, A-2-4	0	0-2	100	90-95	65-80	20-40	21-32	4-12
	17-24	Sandy loam	SC-SM, SC	A-6, A-2-4	0	0-2	100	90-95	65-80	20-40	23-29	7-12
	24-30	Sandy clay loam, clay, clay loam	CL, CH	A-7-6, A-6	0	2-10	85-95	80-90	70-85	65-85	29-51	13-29
	30-80	Bedrock	---	---	---	---	---	---	---	---	---	---
109C: Backbone-----	0-8	Sandy loam	SC, SC-SM	A-6, A-2-4	0	0	100	100	75-85	15-40	21-32	4-12
	8-24	Sandy loam, loamy fine sand	SC-SM, SC	A-6, A-2-4	0	0-2	100	90-95	65-80	20-40	23-29	7-12
	24-30	Clay, sandy clay loam, clay loam	CL, CH	A-7-6, A-6	0	2-10	85-95	80-90	70-85	65-85	29-51	13-29
	30-80	Bedrock	---	---	---	---	---	---	---	---	---	---
109D: Backbone-----	0-8	Sandy loam	SC, SC-SM	A-6, A-2-4	0	0	100	100	75-85	15-40	21-32	4-12
	8-24	Sandy loam, loamy fine sand	SC-SM, SC	A-6, A-2-4	0	0-2	100	90-95	65-80	20-40	23-29	7-12
	24-30	Sandy clay loam, clay, clay loam	CL, CH	A-7-6, A-6	0	2-10	85-95	80-90	70-85	65-85	29-51	13-29
	30-80	Bedrock	---	---	---	---	---	---	---	---	---	---
135: Coland, occasionally flooded-----	0-8	Clay loam, silty clay loam	ML, MH	A-7-5, A-7-6	0	0	100	100	95-100	65-80	47-59	18-24
	8-32	Clay loam, silty clay loam	CL, MH, ML	A-7-5, A-7-6	0	0	100	100	95-100	65-80	43-57	18-24
	32-40	Clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	95-100	65-80	39-53	17-25
	40-44	Sandy loam, loam, clay loam	CL, SC, SC-SM	A-7-6, A-4, A-6	0	0	100	90-100	60-70	40-60	22-42	7-19
	44-52	Sandy loam, clay loam, loam	CL, SC, SC-SM	A-7-6, A-4, A-6	0	0	100	90-100	60-70	40-60	22-42	7-19
	52-66	Loam, clay loam, sandy loam	CL, SC, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	22-40	7-19

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
136B: Ankeny-----	0-8	Fine sandy loam	SC-SM, SC	A-6, A-4, A-2-4	0	0	95-100	95-100	75-90	30-50	25-34	6-11
	8-38	Fine sandy loam	SC-SM, SC	A-6, A-2-4, A-4	0	0	95-100	95-100	75-90	30-50	25-34	6-11
	38-44	Fine sandy loam, sandy loam	SC, SC-SM	A-4, A-2-4	0	0	95-100	95-100	75-90	25-45	21-27	6-10
	44-60	Loamy fine sand, fine sandy loam, fine sand	SC-SM, SP-SM, SM	A-3, A-2-4, A-4	0	0	95-100	95-100	70-80	5-40	0-21	NP-6
162B: Downs-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	30-43	9-18
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	12-17	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	17-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	33-39	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	39-48	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	48-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
162C: Downs-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	30-43	9-18
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	12-17	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	17-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	33-48	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	48-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
162D: Downs-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	30-43	9-18
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	12-17	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	17-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	33-48	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	48-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
162E2: Downs, moderately eroded-----	0-7	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	28-41	9-18
	7-10	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	10-26	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	26-37	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	37-42	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	42-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
163B: Fayette-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-42	9-18
	8-11	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	24-38	9-18
	11-14	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	24-38	9-18
	14-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-34	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	34-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-73	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
163C2: Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
163D2: Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
163E2: Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
163F: Fayette-----	0-3	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-42	9-18
	3-11	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	24-38	9-18
	11-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
163G: Fayette-----	0-3	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-42	9-18
	3-11	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	24-38	9-18
	11-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
175B: Dickinson-----	0-8	Loam, fine sandy loam, sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	25-33	7-11
	8-18	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-2-4, A-4	0	0	100	100	85-95	30-50	21-33	6-11
	18-30	Sandy loam, fine sandy loam	SC, SC-SM	A-6, A-2-4, A-4	0	0	100	100	85-95	35-50	20-28	6-12
	30-36	Sand, fine sand, loamy fine sand, loamy sand	SP-SM, SM, SC-SM	A-2-4	0	0	100	100	80-95	5-20	16-21	2-6
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SC-SM, SP-SM	A-2-4	0	0	100	100	70-90	5-15	16-21	2-6
177C2: Saude, moderately eroded-----	0-8	Loam	CL, SC	A-6, A-7-6	0	0	100	90-100	70-90	50-75	33-41	11-16
	8-24	Loam	CL, CL-ML	A-4, A-6	0	0-3	90-95	90-95	70-90	50-75	23-29	7-12
	24-28	Sandy loam	CL, SC-SM	A-4, A-6	0	0-3	90-95	90-95	60-85	45-60	23-29	7-12
	28-36	Loamy sand	SC-SM, SM, SW	A-1-b	0	0-3	85-95	85-95	20-40	3-25	0-20	NP-4
	36-60	Sand, loamy sand, gravelly coarse sand	SM, SP, SC-SM	A-1-b	0	2-10	55-90	55-85	15-35	3-25	0-20	NP-4
178: Waukee-----	0-8	Silt loam, loam	ML, SC, CL	A-7-6, A-6	0	0	100	90-100	70-90	50-75	34-42	11-16
	8-16	Silt loam, loam	SC, CL	A-6	0	0	100	90-100	70-90	50-75	32-40	12-16
	16-20	Loam, sandy clay loam	CL, SC	A-6, A-7-6	0	0-3	100	90-95	65-85	40-60	28-41	12-19
	20-35	Sandy clay loam, loam	CL, SC	A-6, A-7-6	0	0-3	100	90-95	65-85	40-60	28-41	12-19
	35-44	Gravelly loamy coarse sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4
	44-66	Gravelly loamy coarse sand, gravelly sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4
178B: Waukee-----	0-8	Silt loam, loam	ML, SC, CL	A-7-6, A-6	0	0	100	90-100	70-90	50-75	34-42	11-16
	8-16	Silt loam, loam	SC, CL	A-6	0	0	100	90-100	70-90	50-75	32-40	12-16
	16-20	Loam, sandy clay loam	CL, SC	A-6, A-7-6	0	0-3	100	90-95	65-85	40-60	28-41	12-19
	20-35	Sandy clay loam, loam	CL, SC	A-6, A-7-6	0	0-3	100	90-95	65-85	40-60	28-41	12-19
	35-44	Gravelly loamy coarse sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4
	44-66	Gravelly loamy coarse sand, gravelly sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
196: Volney, occasionally flooded-----	0-30	Channery silt loam	ML, SC	A-7-6, A-6	0-20	10-20	80-95	65-90	55-65	40-60	34-44	11-16
	30-80	Channery silt loam, channery loam, very channery silt loam	SC, SC-SM	A-6, A-2-6, A-2-4	0-35	30-45	60-95	30-85	20-50	15-40	22-37	7-17
196+: Volney, occasionally flooded, overwash-----	0-8	Silt loam	CL, CL-ML	A-6, A-4	0	0	85-100	85-100	85-100	85-100	20-32	6-12
	8-30	Channery silt loam	SC, ML	A-7-6, A-6	0-20	10-20	80-95	65-90	55-65	40-60	34-44	11-16
	30-80	Channery silt loam, channery loam, very channery silt loam	SC, SC-SM	A-6, A-2-6, A-2-4	0-35	30-45	60-95	30-85	20-50	15-40	22-37	7-17
196B: Volney, rarely flooded-----	0-30	Channery silt loam	SC, ML	A-7-6, A-6	0-20	10-20	80-95	65-90	55-65	40-60	34-44	11-16
	30-80	Channery silt loam, channery loam, very channery silt loam	SC, SC-SM	A-2-4, A-2-6, A-6	0-35	30-45	60-95	30-85	20-50	15-40	22-37	7-17
198B: Floyd-----	0-8	Clay loam, loam	ML	A-7-5, A-7-6, A-6	0	0	100	100	80-90	55-75	40-50	13-19
	8-24	Clay loam, loam	ML, CL	A-7-6, A-6	0	0	100	100	80-90	55-75	34-48	13-19
	24-33	Loam, sandy clay loam	CL, SC	A-6	0	0-5	90-95	85-95	50-70	50-65	29-38	12-16
	33-41	Sandy loam, sandy clay loam, loam	SC, SM	A-2-6, A-1-b, A-2-4	0	0-5	90-95	85-95	50-70	15-35	18-36	3-16
	41-50 50-60	Clay loam, loam Clay loam, loam	CL, SC CL, SC	A-7-6, A-6 A-7-6, A-6	0 0	0-5 0-5	90-95 90-95	85-95 85-95	80-90 80-90	50-65 50-65	27-42 27-41	12-21 12-21
221: Klossner-----	0-10	Muck	PT	A-1	0	0	100	100	---	---	---	---
	10-26	Muck	PT	A-1	0	0	100	100	---	---	---	---
	26-48	Mucky silty clay loam	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-95	50-90	25-40	5-20
	48-80	Clay loam	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-95	50-90	25-40	5-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
221+: Klossner, occasionally flooded, overwash-----	0-10	Muck	PT	A-1	0	0	100	100	---	---	---	---
	10-26	Muck	PT	A-1	0	0	100	100	---	---	---	---
	26-48	Mucky silty clay loam	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-95	50-90	25-40	5-20
	48-80	Clay loam	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-95	50-90	25-40	5-20
235: Turlin, rarely flooded-----	0-9	Loam	ML	A-6, A-7-6	0	0	100	100	95-100	60-70	37-47	11-18
	9-34	Loam	ML	A-6, A-7-6	0	0	100	100	95-100	60-70	37-47	11-18
	34-41	Clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	55-70	34-44	13-19
	41-68	Clay loam, loam	CL	A-6, A-7-6	0	0	100	100	95-100	55-70	34-44	13-19
	68-80	Loamy sand, sandy loam, loam	SC-SM, SC	A-6, A-2-4	0	0	95-100	90-100	85-95	15-40	18-29	4-12
Coland, occasionally flooded-----	0-8	Clay loam, silty clay loam	ML, MH	A-7-5, A-7-6	0	0	100	100	95-100	65-80	47-59	18-24
	8-32	Clay loam, silty clay loam	MH, CL, ML	A-7-5, A-7-6	0	0	100	100	95-100	65-80	43-57	18-24
	32-40	Clay loam, loam	CH, CL	A-6, A-7-6	0	0	100	100	95-100	65-80	39-53	17-25
	40-44	Sandy loam, loam, clay loam	CL, SC, SC-SM	A-7-6, A-4, A-6	0	0	100	90-100	60-70	40-60	22-42	7-19
	44-52	Sandy loam, clay loam, loam	CL, SC, SC-SM	A-7-6, A-4, A-6	0	0	100	90-100	60-70	40-60	22-42	7-19
	52-60	Loam, clay loam, sandy loam	CL, SC, SC-SM	A-4, A-6	0	0	100	90-100	60-70	40-60	22-40	7-19
241B: Lilah-----	0-8	Sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0-5	90-95	85-95	60-70	25-40	18-27	2-8
	8-15	Sandy loam, gravelly sandy loam	SC-SM, SC	A-2-4, A-1-b	0	0-5	80-95	60-90	40-60	15-30	20-26	6-9
	15-28	Gravelly loamy sand, sand	SP-SC, SP, SP-SM	A-1-a, A-1-b	0	0-10	70-90	50-90	30-50	3-12	0-21	NP-6
	28-39	Sand, gravelly loamy sand	SP-SC, SP, SP-SM	A-1-a, A-1-b	0	0-5	70-90	50-90	30-50	3-12	0-21	NP-6
	39-60	Sand, loamy sand	SP, SP-SM	A-1-b	0	0-5	80-100	80-100	30-50	3-12	0-18	NP-3

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
241B: Dickinson-----	0-8	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	25-33	7-11
	8-18	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	21-33	6-11
	18-30	Sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	35-50	20-28	6-12
	30-36	Loamy sand, sand, fine sand, loamy fine sand	SP-SM, SM, SC-SM	A-2-4	0	0	100	100	80-95	5-20	16-21	2-6
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SC-SM, SP-SM	A-2-4	0	0	100	100	70-90	5-15	16-21	2-6
241C: Lilah-----	0-8	Sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0-5	90-95	85-95	60-70	25-40	18-27	2-8
	8-15	Sandy loam, gravelly sandy loam	SC-SM, SC	A-2-4, A-1-b	0	0-5	80-95	60-90	40-60	15-30	20-26	6-9
	15-28	Gravelly loamy sand, sand	SP, SP-SC, SP-SM	A-1-a, A-1-b	0	0-10	70-90	50-90	30-50	3-12	0-21	NP-6
	28-39	Sand, gravelly loamy sand	SP-SC, SP, SP-SM	A-1-a, A-1-b	0	0-5	70-90	50-90	30-50	3-12	0-21	NP-6
	39-60	Sand, loamy sand	SP, SP-SM	A-1-b	0	0-5	80-100	80-100	30-50	3-12	0-18	NP-3
Dickinson-----	0-8	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	25-33	7-11
	8-18	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	21-33	6-11
	18-30	Sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	35-50	20-28	6-12
	30-36	Loamy sand, sand, fine sand, loamy fine sand	SP-SM, SM, SC-SM	A-2-4	0	0	100	100	80-95	5-20	16-21	2-6
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SC-SM, SP-SM	A-2-4	0	0	100	100	70-90	5-15	16-21	2-6
241D: Lilah-----	0-8	Sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0-5	90-95	85-95	60-70	25-40	18-27	2-8
	8-15	Sandy loam, gravelly sandy loam	SC-SM, SC	A-2-4, A-1-b	0	0-5	80-95	60-90	40-60	15-30	20-26	6-9
	15-28	Gravelly loamy sand, sand	SP-SC, SP, SP-SM	A-1-a, A-1-b	0	0-10	70-90	50-90	30-50	3-12	0-21	NP-6
	28-39	Sand, gravelly loamy sand	SP-SC, SP, SP-SM	A-1-a, A-1-b	0	0-5	70-90	50-90	30-50	3-12	0-21	NP-6
	39-60	Sand, loamy sand	SP, SP-SM	A-1-b	0	0-5	80-100	80-100	30-50	3-12	0-18	NP-3

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
241D:												
Dickinson-----	0-8	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	25-33	7-11
	8-18	Loam, sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	30-50	21-33	6-11
	18-30	Sandy loam, fine sandy loam	SC, SC-SM	A-6, A-4, A- 2-4	0	0	100	100	85-95	35-50	20-28	6-12
	30-36	Loamy sand, sand, fine sand, loamy fine sand	SP-SM, SM, SC-SM	A-2-4	0	0	100	100	80-95	5-20	16-21	2-6
	36-60	Fine sand, loamy fine sand, loamy sand, sand	SC-SM, SP-SM	A-2-4	0	0	100	100	70-90	5-15	16-21	2-6
285B:												
Burkhardt-----	0-8	Sandy loam, loam	SC, SC-SM, SM	A-4, A-2-4	0	0	95-100	90-100	55-70	25-40	19-28	2-8
	8-17	Sandy loam	SC, SC-SM, SM	A-4, A-2-4	0	0	95-100	90-100	55-70	25-40	19-28	2-8
	17-19	Loamy sand, gravelly coarse sand, sand	SM, SW	A-2-4, A-1-a, A-1-b	0	0	95-100	50-100	20-60	1-30	0-18	NP-3
	19-29	Coarse sand, stratified sand to gravelly coarse sand	GP, SP, SP-SM	A-1-a, A-1-b	0	0	50-85	50-85	20-35	1-5	0-18	NP-3
	29-60	Coarse sand, stratified gravelly coarse sand, stratified sand to gravelly coarse sand	GP, SP, SP-SM	A-1-a, A-1-b	0	0	50-85	50-85	20-35	1-5	0-18	NP-3
285F:												
Burkhardt-----	0-10	Sandy loam, loam	SC, SC-SM, SM	A-4, A-2-4	0	0	95-100	90-100	55-70	25-40	19-28	2-8
	10-17	Sandy loam	SC, SC-SM, SM	A-4, A-2-4	0	0	95-100	90-100	55-70	25-40	19-28	2-8
	17-19	Loamy sand, gravelly coarse sand, sand	SM, SW	A-2-4, A-1-a, A-1-b	0	0	95-100	50-100	20-60	1-30	0-18	NP-3
	19-29	Coarse sand, stratified sand to gravelly coarse sand	GP, SP, SP-SM	A-1-a, A-1-b	0	0	50-85	50-85	20-35	1-5	0-18	NP-3
	29-60	Coarse sand, stratified gravelly coarse sand, stratified sand to gravelly coarse sand	GP, SP, SP-SM	A-1-a, A-1-b	0	0	50-85	50-85	20-35	1-5	0-18	NP-3

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
291B: Atterberry-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	31-44	9-18
	8-17	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	26-38	9-18
	17-24	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-43	16-23
	24-48	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-43	16-23
	48-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	30-41	13-21
302B: Coggon-----	0-3	Loam, silt loam	CL	A-6	0	0	100	95-100	90-95	65-85	32-40	12-16
	3-11	Loam, silt loam	CL	A-6	0	0	100	95-100	90-95	65-85	27-36	12-16
	11-17	Sandy clay loam, loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	32-39	15-19
	17-31	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
	31-44	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
	44-62	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
	62-80	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
302C: Coggon-----	0-3	Loam, silt loam	CL	A-6	0	0	100	95-100	90-95	65-85	32-40	12-16
	3-11	Loam, silt loam	CL	A-6	0	0	100	95-100	90-95	65-85	27-36	12-16
	11-17	Sandy clay loam, loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	32-40	15-19
	17-24	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
	24-60	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
302C2: Coggon, moderately eroded-----	0-8	Loam, silt loam	CL	A-6	0	0	100	95-100	90-95	65-85	30-39	12-16
	8-11	Sandy clay loam, loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	32-40	15-19
	11-24	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
	24-60	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-46	12-25
320: Arenzville, occasionally flooded-----	0-10	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	95-100	80-95	23-33	6-11
	10-25	Stratified silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	95-100	80-95	21-29	6-12
	25-40	Silty clay loam, silt loam	CL-ML, CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-95	22-46	6-21
	40-60	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	95-100	80-95	22-34	6-11

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
391B: Clyde-----	0-8	Clay loam, silty clay loam, loam, silt loam	MH, ML	A-7-6, A-7-5	0	0-5	95-100	95-100	80-90	55-75	42-61	13-22
	8-17	Silty clay loam, clay loam	CL, MH, ML	A-7-5, A-7-6	0	0-5	95-100	95-100	80-90	55-75	42-54	19-22
	17-23	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0-5	95-100	95-100	80-90	55-75	40-50	19-22
	23-41	Clay loam, silty clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	75-90	50-75	32-44	15-21
	41-44	Sandy loam, loam	SC, SC-SM	A-1-b, A-2-4	0	2-5	85-95	85-95	50-80	15-35	21-27	6-9
	44-62	Loam, clay loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	29-39	13-19
	62-66	Clay loam, loam	CL, SC	A-6	0-5	2-5	90-95	85-95	75-90	45-65	29-39	13-19
Floyd-----	0-8	Clay loam, loam	ML	A-7-5, A-7-6, A-6	0	0	100	100	80-90	55-75	40-50	13-19
	8-24	Clay loam, loam	ML, CL	A-7-6, A-6	0	0	100	100	80-90	55-75	34-48	13-19
	24-33	Loam, sandy clay loam	CL, SC	A-6	0	0-5	90-95	85-95	50-70	50-65	29-38	12-16
	33-41	Sandy loam, sandy clay loam, loam	SC, SM	A-2-6, A-1-b, A-2-4	0	0-5	90-95	85-95	50-70	15-35	18-36	3-16
	41-50	Clay loam, loam	CL, SC	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-42	12-21
	50-60	Clay loam, loam	CL, SC	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	27-41	12-21
394B: Ostrander-----	0-8	Silt loam, loam	CL, ML	A-7-6, A-6	0	0	100	95-100	90-95	70-90	34-45	11-18
	8-16	Silt loam, loam	CL, ML	A-7-6, A-6	0	0	100	95-100	90-95	70-90	34-45	11-18
	16-24	Silt loam, loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	90-95	70-90	29-41	12-19
	24-30	Loam, sandy loam, sandy clay loam	CL, SC	A-6	0	0-5	95-100	75-100	65-90	45-65	23-39	8-19
	30-50	Loam, sandy loam, sandy clay loam	CL, SC	A-6	0	0-5	95-100	75-100	65-90	45-65	23-39	8-19
	50-60	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	95-100	90-100	80-95	50-75	27-41	12-21
394C: Ostrander-----	0-8	Silt loam, loam	CL, ML	A-7-6, A-6	0	0	100	95-100	90-95	70-90	34-45	11-18
	8-16	Silt loam, loam	CL, ML	A-7-6, A-6	0	0	100	95-100	90-95	70-90	34-45	11-18
	16-24	Silt loam, loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	90-95	70-90	29-41	12-19
	24-50	Loam, sandy loam, sandy clay loam	CL, SC	A-6	0	0-5	95-100	75-100	65-90	45-65	23-39	8-19
	50-60	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	95-100	90-100	80-95	50-75	27-41	12-21
395B: Marquis-----	0-8	Loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	85-95	65-75	34-44	11-18
	8-19	Loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	85-95	65-75	34-44	11-18
	19-24	Loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	85-95	65-75	31-44	13-21
	24-54	Clay loam, loam	SC, CL	A-7-6, A-6	0	0-5	90-95	90-95	80-90	50-65	29-42	13-21
	54-80	Clay loam, loam	SC, CL	A-7-6, A-6	0	0-5	90-95	90-95	80-90	50-65	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
444: Jacwin-----	0-8	Silty clay loam, loam, silt loam	SM, MH, ML	A-6, A-7-5	0	0	100	100	90-95	50-80	40-54	13-22
	8-13	Silty clay loam, loam, silt loam	SM, MH, ML	A-7-5, A-7-6	0	0	100	100	90-95	50-80	44-54	16-22
	13-24	Loam, sandy clay loam, clay loam	CL, SC	A-7-6, A-6	0	0-5	95-100	90-95	85-95	45-65	31-46	13-22
	24-37	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-73	33-45
	37-80	Bedrock	---	---	---	---	---	---	---	---	---	---
444B: Jacwin-----	0-8	Silty clay loam, loam, silt loam	SM, MH, ML	A-6, A-7-6, A-7-5	0	0	100	100	90-95	50-80	39-53	13-22
	8-13	Loam, silty clay loam, silt loam	SM, MH, ML	A-7-5, A-7-6	0	0	100	100	90-95	50-80	43-53	16-22
	13-24	Sandy clay loam, loam, clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	85-95	45-65	31-46	13-22
	24-37	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-73	33-45
	37-80	Bedrock	---	---	---	---	---	---	---	---	---	---
444C: Jacwin-----	0-8	Silty clay loam, loam, silt loam	SM, MH, ML	A-7-5, A-6, A-7-6	0	0	100	100	90-95	50-80	39-53	13-22
	8-13	Silt loam, loam, silty clay loam	SM, MH, ML	A-7-5, A-7-6	0	0	100	100	90-95	50-80	43-53	16-22
	13-24	Sandy clay loam, loam, clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	85-95	45-65	31-46	13-22
	24-37	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-73	33-45
	37-80	Bedrock	---	---	---	---	---	---	---	---	---	---
468B: Dunkerton-----	0-8	Loamy fine sand, loamy sand, fine sandy loam, sandy loam	SM, SC	A-6, A-2-4, A-4	0	0	100	95-100	85-95	30-50	17-30	2-12
	8-15	Fine sandy loam, loamy sand, loamy fine sand, sandy loam	SC, SM	A-6, A-2-4, A-4	0	0	100	95-100	85-95	30-50	17-29	2-12
	15-25	Sandy loam, sandy clay loam	SC-SM, SC	A-6, A-2-4	0	0	100	95-100	85-95	30-50	20-32	6-15
	25-36	Loam, clay loam, sandy clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	29-41	13-21
	36-49	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	29-41	13-21
	49-80	Loam, clay loam	SC, CL	A-7-6, A-6	0	0-5	90-95	85-95	80-90	50-65	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches					Pct	Pct
	In											
471: Oran-----	0-8	Loam	ML, CL	A-7-6, A-4, A-6	0	0	100	100	85-95	55-75	32-42	10-16
	8-13	Loam	CL	A-4, A-6	0	0	100	100	85-95	55-75	25-37	10-16
	13-18	Loam	CL	A-6, A-4	0	0	100	100	85-95	55-75	25-37	10-16
	18-45	Loam, sandy clay loam, clay loam	CL	A-7-6, A-6	0	0-5	90-95	85-90	75-85	55-65	31-42	15-21
	45-80	Clay loam, loam	CL	A-7-6, A-6	0	0-5	90-95	85-90	75-85	55-65	31-41	15-21
471B: Oran-----	0-8	Loam	CL	A-7-6, A-6, A-4	0	0	100	100	85-95	55-75	31-41	10-16
	8-13	Loam	CL	A-6, A-4	0	0	100	100	85-95	55-75	25-37	10-16
	13-18	Loam	CL	A-6, A-4	0	0	100	100	85-95	55-75	25-37	10-16
	18-45	Loam, sandy clay loam, clay loam	CL	A-7-6, A-6	0	0-5	90-95	85-90	75-85	55-65	31-42	15-21
	45-80	Clay loam, loam	CL	A-7-6, A-6	0	0-5	90-95	85-90	75-85	55-65	31-41	15-21
480B: Orwood-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	90-100	80-90	30-41	9-16
	8-10	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	10-22	Loam, clay loam, silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	22-55	Clay loam, silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	55-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18
480C2: Orwood, moderately eroded-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-90	29-40	9-16
	8-22	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	22-50	Silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	50-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18
480D2: Orwood, moderately eroded-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-90	29-40	9-16
	8-22	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	22-50	Silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	50-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
480E2: Orwood, moderately eroded-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-90	29-40	9-16
	8-22	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	22-50	Silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	50-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18
480E3: Orwood, severely eroded-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-90	27-38	9-16
	8-45	Silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	45-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18
480F2: Orwood, moderately eroded-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-90	29-40	9-16
	8-22	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	29-38	12-16
	22-50	Silt loam, loam	CL	A-7-6, A-6	0	0	100	100	85-95	60-80	34-41	15-19
	50-80	Silt loam, loam	CL	A-6	0	0	100	100	85-95	70-90	27-37	12-18
482B: Racine-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0	95-100	95-100	90-100	55-85	33-44	11-18
	8-12	Silt loam, loam	CL	A-7-6, A-6	0	0	95-100	95-100	90-100	55-85	29-43	12-18
	12-28	Clay loam, loam	CL	A-7-6, A-6	0	0	95-100	95-100	90-100	55-85	32-45	15-23
	28-46	Clay loam, sandy clay loam, loam	SC, CL	A-7-6, A-6	0	0-5	95-100	75-100	65-90	45-65	28-43	12-23
	46-65	Clay loam, loam	SC, CL	A-7-6, A-6	0	0-5	95-100	90-100	80-95	50-75	27-41	12-21
484: Lawson, occasionally flooded-----	0-8	Silt loam	ML	A-7-5, A-6, A-4	0	0	100	100	90-100	85-100	29-49	5-18
	8-30	Silt loam	ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	29-49	5-18
	30-40	Silty clay loam, silt loam	MH, CL-ML, ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	27-54	6-20
	40-60	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-100	29-48	12-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
485: Spillville, occasionally flooded-----	0-20	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	20-54	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	54-80	Sandy loam, sandy clay loam, loam	CL, SC	A-6, A-2-4	0	0	100	95-100	80-90	35-75	28-40	9-16
487B: Otter, frequently flooded-----	0-8	Silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	95-100	90-100	80-100	35-48	11-18
	8-27	Silt loam	ML, CL	A-7-5, A-6, A-7-6	0	0	100	95-100	90-100	80-100	35-48	11-18
	27-34	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	80-100	29-46	12-21
	34-41	Silt loam, silty clay loam	CL	A-4, A-7-6, A-6	0	0	100	95-100	90-95	80-100	26-42	9-19
	41-65	Silt loam, stratified loam to silt loam, silty clay loam	CL, SC	A-4, A-7-6, A-6	0	0	90-100	80-100	55-95	45-85	26-42	9-19
Worthen-----	0-8	Silt loam	ML, CL	A-7-6, A-6, A-4	0	0	100	100	95-100	80-100	32-41	9-14
	8-20	Silt loam	ML, CL	A-7-6, A-6, A-4	0	0	100	100	95-100	80-100	32-41	9-14
	20-29	Silt loam	ML, CL	A-7-6, A-6, A-4	0	0	100	100	95-100	80-100	32-41	9-14
	29-64	Silt loam	CL	A-6	0	0	100	100	95-100	80-100	28-36	12-16
	64-80	Silt loam	CL-ML, CL	A-6, A-4	0	0	100	100	95-100	80-100	22-31	7-13
489: Ossian, occasionally flooded-----	0-8	Silt loam	ML, MH	A-7-5, A-7-6	0	0	100	100	100	95-100	42-51	14-18
	8-15	Silt loam	ML, MH	A-7-6, A-7-5	0	0	100	100	100	95-100	42-51	14-18
	15-23	Silt loam	ML, CL	A-6, A-7-6, A-7-5	0	0	100	100	100	95-100	38-49	15-18
	23-32	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-48	13-21
	32-66	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-48	13-21
	66-80	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-48	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
491D2: Renova, moderately eroded-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-95	75-90	33-42	13-19
	8-19	Silty clay loam, clay loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-95	80-95	34-43	16-23
	19-52	Loam, sandy clay loam, clay loam	SC, CL	A-6	0	0-5	95-100	85-95	65-85	45-65	27-38	12-19
	52-60	Loam	SC, CL	A-6	0	0-5	95-100	90-100	80-95	50-75	27-38	12-19
491E2: Renova, moderately eroded-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-95	75-90	33-42	13-19
	8-19	Silty clay loam, clay loam, loam	CL	A-7-6, A-6	0	0	100	98-100	90-95	80-95	34-43	16-23
	19-52	Loam, sandy clay loam, clay loam	SC, CL	A-6	0	0-5	95-100	85-95	65-85	45-65	27-38	12-19
	52-60	Loam	SC, CL	A-6	0	0-5	95-100	90-100	80-95	50-75	27-38	12-19
499D: Nordness-----	0-4	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	32-40	12-16
	4-7	Loam, silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-90	32-41	15-20
	7-13	Loam, silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-90	32-41	15-20
	13-16	Silty clay loam, clay, silty clay	CH, CL	A-7-6, A-6	0	2-10	85-95	80-90	70-85	65-85	40-67	21-41
	16-80	Bedrock	---	---	---	---	---	---	---	---	---	---
499G: Nordness-----	0-4	Loam, silt loam	CL	A-6	0	0	100	100	90-100	70-90	32-40	12-16
	4-13	Loam, silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-90	32-41	15-20
	13-16	Silty clay loam, clay, silty clay	CH, CL	A-7-6, A-6	0	2-10	85-95	80-90	70-85	65-85	40-67	21-41
	16-80	Bedrock	---	---	---	---	---	---	---	---	---	---
512B: Marlean-----	0-7	Loam	SC, CL, ML	A-7-6, A-6	0-10	0-10	85-100	70-100	60-85	50-85	34-42	11-16
	7-9	Loam	SC, CL, ML	A-7-6, A-6	0-10	0-10	85-100	70-100	60-85	50-85	34-42	11-16
	9-12	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-7-6	0-10	0-10	80-100	75-100	70-85	50-85	27-42	12-21
	12-80	Flaggy loam, very flaggy loam	GP-GC, GC	A-6, A-2-6	0-10	15-65	35-70	35-70	15-55	12-40	27-38	12-19

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In											
512C: Marlean-----	0-8	Loam	SC, CL, ML	A-6, A-7-6	0-10	0-10	85-100	70-100	60-85	50-85	34-42	11-16
	8-12	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0-10	0-10	80-100	75-100	70-85	50-85	27-42	12-21
	12-80	Flaggy loam, very flaggy loam	GP-GC, GC	A-6, A-2-6	0-10	15-65	35-70	35-70	15-55	12-40	27-38	12-19
512C2: Marlean, moderately eroded-----	0-8	Loam	CL, SC	A-6, A-7-6	0-10	0-10	85-100	70-100	60-85	50-85	33-41	11-16
	8-12	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0-10	0-10	80-100	75-100	70-85	50-85	27-42	12-21
	12-80	Flaggy loam, very flaggy loam	GP-GC, GC	A-6, A-2-6	0-10	15-65	35-70	35-70	15-55	12-40	27-38	12-19
512D2: Marlean, moderately eroded-----	0-8	Loam	CL, SC	A-6, A-7-6	0-10	0-10	85-100	70-100	60-85	50-85	33-41	11-16
	8-12	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-7-6	0-10	0-10	80-100	75-100	70-85	50-85	27-42	12-21
	12-80	Flaggy loam, very flaggy loam	GP-GC, GC	A-6, A-2-6	0-10	15-65	35-70	35-70	15-55	12-40	27-38	12-19
512E2: Marlean, moderately eroded-----	0-8	Loam	CL, SC	A-6, A-7-6	0-10	0-10	85-100	70-100	60-85	50-85	33-41	11-16
	8-12	Sandy clay loam, clay loam, loam	SC, CL	A-6, A-7-6	0-10	0-10	80-100	75-100	70-85	50-85	27-42	12-21
	12-80	Flaggy loam, very flaggy loam	GP-GC, GC	A-6, A-2-6	0-10	15-65	35-70	35-70	15-55	12-40	27-38	12-19
582B: Kasson-----	0-8	Loam, silt loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	85-95	65-85	33-42	11-17
	8-11	Loam, silt loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-85	28-37	12-17
	11-20	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-85	28-37	12-17
	20-41	Sandy clay loam, clay loam, loam	CL, SC	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	41-53	Loam	CL, SC	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	53-69	Loam	CL, SC	A-6	0	0-5	90-95	85-95	80-90	50-65	29-35	13-16
	69-80	Loam	CL, SC	A-6	0	0-5	90-95	85-95	80-90	50-65	29-35	13-16

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
582C: Kasson-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0-5	95-100	95-100	85-95	65-85	33-42	11-17
	8-10	Silt loam, loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-85	28-37	12-17
	10-14	Loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-85	28-37	12-17
	14-43	Sandy clay loam, clay loam, loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	43-59	Loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	59-73	Loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-35	13-16
582C2: Kasson, moderately eroded-----	0-8	Silt loam, loam	CL	A-6	0	0-5	95-100	95-100	85-95	65-85	30-40	12-17
	8-43	Sandy clay loam, clay loam, loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	43-59	Loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-39	13-19
	59-73	Loam	SC, CL	A-6	0	0-5	90-95	85-95	80-90	50-65	29-35	13-16
626: Hayfield-----	0-8	Silt loam, loam	ML, CL	A-7-6, A-6	0	0	100	100	90-98	70-90	34-45	11-18
	8-13	Silt loam, loam	CL	A-6	0	0	100	100	90-98	70-90	28-39	12-19
	13-29	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0	0	95-100	90-100	70-90	40-75	27-42	12-21
	29-80	Loamy sand, sand, loamy coarse sand, coarse sand	SM, SW, SP-SM	A-1-b	0	0-3	85-100	80-95	25-50	0-15	0-17	NP-2
762B: Downs-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	30-43	9-18
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	12-17	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	17-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	33-48	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
	48-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
Tama-----	0-8	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	100	100	95-100	34-45	11-18
	8-14	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	39-49	16-22
	14-45	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	36-46	16-22
	45-60	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
762C: Downs-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	30-43	9-18
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	12-17	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-38	9-18
	17-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	35-44	16-23
	33-48	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
	48-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
Tama-----	0-8	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	100	100	95-100	34-45	11-18
	8-14	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	39-49	16-22
	14-45	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	36-46	16-22
	45-60	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
775B: Billett-----	0-8	Fine sandy loam, sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0	100	95-100	60-100	25-50	18-29	2-9
	8-13	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	21-29	6-12
	13-28	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	20-28	6-12
	28-41	Loamy sand, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	41-47	Sandy loam, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	47-52	Loamy sand, fine sand, loamy fine sand, sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	80-100	20-75	5-30	0-19	NP-3
	52-60	Gravelly sand, sand, loamy sand, gravelly loamy sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	75-100	20-75	5-30	0-19	NP-3

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
775C: Billett-----	0-8	Fine sandy loam, sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0	100	95-100	60-100	25-50	18-29	2-9
	8-13	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	21-29	6-12
	13-28	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	20-28	6-12
	28-41	Loamy sand, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	41-47	Sandy loam, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	47-52	Loamy sand, fine sand, loamy fine sand, sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	80-100	20-75	5-30	0-19	NP-3
	52-60	Gravelly sand, sand, loamy sand, gravelly loamy sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	75-100	20-75	5-30	0-19	NP-3
775D: Billett-----	0-8	Fine sandy loam, sandy loam	SM, SC-SM, SC	A-2-4, A-4	0	0	100	95-100	60-100	25-50	18-29	2-9
	8-13	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	21-29	6-12
	13-28	Fine sandy loam, sandy loam	SC-SM, SC	A-2-4, A-4, A-6	0	0	100	95-100	60-100	25-50	20-28	6-12
	28-41	Loamy sand, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	41-47	Sandy loam, fine sandy loam	SC-SM, SC	A-2-4, A-6	0	0	95-100	85-100	75-90	20-45	18-28	4-12
	47-52	Loamy sand, fine sand, loamy fine sand, sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	80-100	20-75	5-30	0-19	NP-3
	52-60	Gravelly sand, sand, loamy sand, gravelly loamy sand	SM, SW-SM	A-2-4, A-1-b	0	0-5	85-100	75-100	20-75	5-30	0-19	NP-3
782B: Donnan-----	0-8	Silt loam, loam	CL	A-7-6, A-4, A-6	0	0	100	100	85-95	65-80	30-43	9-18
	8-13	Silt loam, loam	CL	A-6	0	0	100	100	85-95	65-80	30-38	13-18
	13-18	Loam, silt loam	CL	A-6	0	0	100	100	85-95	65-80	30-38	13-18
	18-24	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0-5	95-100	90-95	80-90	60-85	29-41	13-21
	24-34	Silty clay	CH	A-7-6	0	0-3	95-100	90-95	85-95	85-95	52-67	31-41
	34-48	Silty clay	CH	A-7-6	0	0-3	95-100	90-95	85-95	85-95	52-67	31-41
	48-60	Clay loam, loam	CL	A-6, A-7-6	0	0-5	95-100	85-95	80-90	55-75	34-43	16-23

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
793:												
Bertrand-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	85-90	30-39	9-15
	8-44	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	85-95	27-42	12-21
	44-55	Stratified sand to silt loam	CL, SM	A-6, A-4, A-2-4	0	0	100	100	80-95	35-75	16-30	2-13
	55-60	Sand, fine sand, loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	80-100	50-80	5-35	0-16	NP-1
793B:												
Bertrand-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	85-90	29-38	9-15
	8-44	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	85-95	27-42	12-21
	44-55	Stratified sand to silt loam	CL, SM	A-6, A-4, A-2-4	0	0	100	100	80-95	35-75	16-30	2-13
	55-60	Sand, fine sand, loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0	80-100	80-100	50-80	5-35	0-16	NP-1
806B:												
Whalan-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0	100	95-100	85-95	60-90	32-41	12-17
	8-12	Clay loam, loam	CL	A-7-6, A-6	0	0	95-100	95-100	80-95	70-90	28-47	12-25
	12-22	Loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	80-95	70-90	28-47	12-25
	22-24	Clay loam, silty clay, clay	CH, SC	A-7-6	0	0-5	80-100	70-95	65-90	50-85	45-72	25-45
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
806C2:												
Whalan, moderately eroded-----	0-8	Silt loam, loam	CL	A-6	0	0	100	95-100	85-95	60-90	30-40	12-17
	8-22	Loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	80-95	70-90	28-47	12-25
	22-24	Clay loam, silty clay, clay	CH, SC	A-7-6	0	0-5	80-100	70-95	65-90	50-85	45-72	25-45
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
806D:												
Whalan-----	0-8	Silt loam, loam	CL	A-7-6, A-6	0	0	100	95-100	85-95	60-90	32-41	12-17
	8-12	Clay loam, loam	CL	A-7-6, A-6	0	0	95-100	95-100	80-95	70-90	28-47	12-25
	12-22	Loam, clay loam	CL	A-7-6, A-6	0	0	95-100	95-100	80-95	70-90	28-47	12-25
	22-24	Clay loam, silty clay, clay	CH, SC	A-7-6	0	0-5	80-100	70-95	65-90	50-85	45-72	25-45
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
813B:												
Atkinson-----	0-7	Loam	ML, CL	A-7-6, A-6	0	0	100	95-100	85-95	55-75	34-42	11-16
	7-13	Loam	ML, CL	A-7-6, A-6	0	0	100	95-100	85-95	55-75	32-42	12-16
	13-24	Clay loam, sandy clay loam, loam	SC, CL	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	36-46	16-22
	24-45	Loam, sandy clay loam, clay loam	SC, CL	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	31-49	13-25
	45-50	Clay	CL, CH	A-7-6	0	2-10	85-95	80-95	80-90	70-90	50-62	29-37
	50-80	Bedrock	---	---	---	---	---	---	---	---	---	---
814:												
Rockton-----	0-8	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	8-15	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	15-26	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0	0	90-100	90-100	75-90	45-70	36-47	17-25
	26-31	Silty clay, clay, clay loam	CH, CL	A-7-6	0	0-2	90-100	90-100	90-95	70-90	45-72	25-45
	31-80	Bedrock	---	---	---	---	---	---	---	---	---	---
814B:												
Rockton-----	0-8	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	8-15	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	15-26	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0	0	90-100	90-100	75-90	45-70	36-47	17-25
	26-31	Clay loam, clay, silty clay	CH, CL	A-7-6	0	0-2	90-100	90-100	90-95	70-90	45-72	25-45
	31-80	Bedrock	---	---	---	---	---	---	---	---	---	---
814C:												
Rockton-----	0-8	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	8-15	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	15-26	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0	0	90-100	90-100	75-90	45-70	36-47	17-25
	26-31	Silty clay, clay, clay loam	CH, CL	A-7-6	0	0-2	90-100	90-100	90-95	70-90	45-72	25-45
	31-80	Bedrock	---	---	---	---	---	---	---	---	---	---
814D:												
Rockton-----	0-8	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	8-15	Loam	CL, SC, ML	A-7-6, A-6	0	0	90-100	90-100	85-95	50-75	34-45	11-18
	15-26	Sandy clay loam, clay loam, loam	SC, CL	A-7-6, A-6	0	0	90-100	90-100	75-90	45-70	36-47	17-25
	26-31	Silty clay, clay, clay loam	CH, CL	A-7-6	0	0-2	90-100	90-100	90-95	70-90	45-72	25-45
	31-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
837D2: Village, moderately eroded-----	0-8	Silt loam	CL	A-6	0	0	100	100	100	95-100	30-40	12-17
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	29-46	13-25
	26-31	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	29-46	13-25
	31-36	Clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	37-46	19-25
	36-50	Silty clay, clay	GC, CH	A-7-5, A-7-6	0-2	2-5	70-95	65-95	55-90	40-70	55-83	33-52
	50-57	Silty clay, clay	GC, CH	A-7-5, A-7-6	0-2	2-5	70-95	65-95	55-90	40-70	55-83	33-52
	57-60	Clay loam, loam, sandy clay loam	GC, SC, CH	A-7-6, A-2-4, A-6	0-2	5-10	65-95	60-90	40-75	30-60	24-51	9-29
837E2: Village, moderately eroded-----	0-8	Silt loam	CL	A-6	0	0	100	100	100	95-100	30-40	12-17
	8-10	Silt loam	CL	A-6	0	0	100	100	100	95-100	27-36	12-17
	10-31	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	29-46	13-25
	31-36	Clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	37-46	19-25
	36-57	Silty clay, clay	GC, CH	A-7-5, A-7-6	0-2	2-5	70-95	65-95	55-90	40-70	55-83	33-52
	57-60	Clay loam, loam, sandy clay loam	GC, SC, CH	A-7-6, A-2-4, A-6	0-2	5-10	65-95	60-90	40-75	30-60	24-51	9-29
	838D: Allamakee-----	0-8	Silt loam	CL-ML, CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	27-42
8-10		Silt loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	30-47	13-25
10-16		Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	30-47	13-25
16-23		Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	29-46	13-25
23-27		Silty clay, clay, clay loam	CH, GC, CL	A-7-5, A-7-6	0-2	2-5	70-95	65-95	55-90	40-70	45-83	25-52
27-32		Clay, cobbly clay	CH, GC	A-7-5, A-7-6	0-2	5-25	70-95	65-95	55-90	40-70	61-83	37-52
32-48		Cobbly clay, clay	CH, GC	A-7-5, A-7-6	0-2	15-35	70-95	65-95	55-90	40-70	61-83	37-52
48-60		Stratified sandy loam to loam to sandy clay loam to sandy clay to clay	CH, SC, GC	A-6, A-2-4, A-7-6	0-2	10-20	65-100	65-100	40-75	30-60	24-62	9-37

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
838E: Allamakee-----	0-8	Silt loam	CL-ML, CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	27-42	7-17
	8-16	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	30-47	13-25
	16-23	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	70-95	29-46	13-25
	23-27	Silty clay, clay, clay loam	GC, CH, CL	A-7-5, A-7-6	0-2	2-5	70-95	65-95	55-90	40-70	45-83	25-52
	27-48	Cobbly clay	CH, GC	A-7-5, A-7-6	0-2	15-35	70-95	65-95	55-90	40-70	61-83	37-52
	48-60	Stratified sandy loam to loam to sandy clay loam to sandy clay to clay	GC, CH, SC	A-6, A-2-4, A-7-6	0-2	10-20	65-100	65-100	40-75	30-60	24-62	9-37
840E: Lacrescent-----	0-10	Silt loam, cobbly silty clay loam	ML, GC	A-2-6, A-7-6	0-10	30-55	55-80	45-80	40-65	20-60	34-50	11-21
	10-17	Cobbly silt loam, very cobbly loam, cobbly fine sandy loam, cobbly loam	CL, GC, GC-GM	A-6, A-1-b, A-4	0-10	30-55	55-80	45-80	40-65	20-60	20-35	4-15
	17-28	Very cobbly fine sandy loam, very cobbly silt loam, very cobbly loam	CL, GC, GC-GM	A-2-4, A-6, A-1-b	0-10	40-65	50-75	45-70	35-60	15-55	18-30	4-13
	28-60	Very cobbly loam, very cobbly fine sandy loam, very cobbly silt loam	CL, GC, GC-GM	A-1-b, A-2-4, A-6	0-10	40-65	50-75	45-70	35-60	15-55	18-30	4-13
840G: Lacrescent-----	0-10	Silt loam, cobbly silty clay loam	ML, GC	A-2-6, A-7-6	0-10	30-55	55-80	45-80	40-65	20-60	34-50	11-21
	10-17	Cobbly silt loam, very cobbly loam, cobbly fine sandy loam, cobbly loam	CL, GC, GC-GM	A-6, A-1-b, A-4	0-10	30-55	55-80	45-80	40-65	20-60	20-35	4-15
	17-28	Very cobbly fine sandy loam, very cobbly silt loam, very cobbly loam	CL, GC, GC-GM	A-1-b, A-2-4, A-6	0-10	40-65	50-75	45-70	35-60	15-55	18-30	4-13
	28-60	Very cobbly fine sandy loam, very cobbly loam, very cobbly silt loam	CL, GC, GC-GM	A-1-b, A-2-4, A-6	0-10	40-65	50-75	45-70	35-60	15-55	18-30	4-13

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
841G: Boone-----	0-3	Sand, loamy sand	SP-SM, ML, SM	A-4, A-2-4, A-1-b	0	0	75-100	75-100	40-90	10-60	0-20	NP-3
	3-8	Loamy sand, coarse sand, sand	SP, SM	A-1-b, A-2-4	0	0	75-100	75-100	30-75	2-35	0-14	NP
	8-21	Coarse sand, loamy sand, sand	SP, SM	A-1-b, A-2-4	0	0	75-100	75-100	30-75	2-35	0-14	NP
	21-35	Fine sand, coarse sand, sand	SP, SM	A-1-b, A-2-4	0	0	75-100	75-100	30-75	2-35	0-14	NP
	35-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
861E: Yellowriver----	0-5	Loam, silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	95-100	80-90	29-43	9-18
	5-12	Loam, silt loam	CL-ML, CL	A-7-6, A-4	0	0	100	100	95-100	85-100	23-47	7-25
	12-18	Loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	85-100	30-47	13-25
	18-26	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	85-100	30-47	13-25
	26-48	Silty clay loam, silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	48-60	Silty clay loam, silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
861F: Yellowriver----	0-5	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	95-100	80-90	29-43	9-18
	5-12	Silty clay loam, silt loam	CL-ML, CL	A-7-6, A-4	0	0	100	100	95-100	85-100	23-47	7-25
	12-26	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	95-100	85-100	30-47	13-25
	26-48	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	48-60	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
903C: Frankville-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	30-42	9-17
	8-14	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	26-39	9-17
	14-18	Silty clay loam, silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	26-39	9-17
	18-23	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	32-43	16-23
	23-28	Clay, silty clay	CL, CH	A-7-6	0	2-10	85-95	80-90	70-85	65-80	50-67	29-41
	28-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
903D2: Frankville, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-41	9-17
	8-18	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	26-38	9-17
	18-23	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	32-43	16-23
	23-28	Clay, silty clay	CH, CL	A-7-6	0	2-10	85-95	80-90	70-85	65-80	50-67	29-41
	28-80	Bedrock	---	---	---	---	---	---	---	---	---	---
903E2: Frankville, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-41	9-17
	8-18	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	26-38	9-17
	18-23	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	32-43	16-23
	23-28	Clay, silty clay	CL, CH	A-7-6	0	2-10	85-95	80-90	70-85	65-80	50-67	29-41
	28-80	Bedrock	---	---	---	---	---	---	---	---	---	---
912F: Paintcreek-----	0-4	Silt loam	CL-ML, CL	A-7-6, A-4, A-6	0	0	100	100	95-100	95-100	26-41	7-17
	4-8	Silt loam	CL-ML, CL	A-7-6, A-4, A-6	0	0	100	100	95-100	95-100	26-41	7-17
	8-11	Silt loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	30-42	13-21
	11-15	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	30-42	13-21
	15-35	Silty clay, silty clay loam, cobbly clay, cobbly silty clay, cobbly silty clay loam, cobbly clay loam, clay loam, clay	GC, CH	A-7-5, A-7-6	0-5	5-35	70-95	65-95	55-90	40-70	45-83	25-52
	35-43	Cobbly silty clay, clay, silty clay, cobbly clay	GC, CH	A-7-5, A-7-6	0-5	5-35	70-95	65-95	55-90	40-70	61-83	37-52
	43-60	Silty clay, clay, cobbly silty clay, cobbly clay	GC, CH	A-7-5, A-7-6	0-5	5-35	70-95	65-95	55-90	40-70	61-83	37-52

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
914B:												
Winneshiek-----	0-8	Loam	CL	A-6, A-7-6	0	0	100	95-100	85-95	55-70	33-44	11-18
	8-11	Loam	CL, SC	A-6	0	2-5	90-95	80-95	80-90	50-65	29-39	13-19
	11-16	Loam	CL, SC	A-6	0	2-5	90-95	80-95	80-90	50-65	29-39	13-19
	16-21	Loam, clay loam	CL, SC	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	29-47	13-25
	21-24	Clay, silty clay	CH, CL	A-7-6	0-5	0-10	85-95	80-95	80-90	70-90	50-68	29-41
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
914C:												
Winneshiek-----	0-8	Loam	CL	A-7-6, A-6	0	0	100	95-100	85-95	55-70	33-44	11-18
	8-16	Loam	CL, SC	A-6	0	2-5	90-95	80-95	80-90	50-65	29-39	13-19
	16-21	Loam, clay loam	CL, SC	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	29-47	13-25
	21-24	Clay, silty clay	CH, CL	A-7-6	0-5	0-10	85-95	80-95	80-90	70-90	50-68	29-41
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
914D:												
Winneshiek-----	0-8	Loam	CL	A-6, A-7-6	0	0	100	95-100	85-95	55-70	33-44	11-18
	8-16	Loam	CL, SC	A-6	0	2-5	90-95	80-95	80-90	50-65	29-39	13-19
	16-21	Loam, clay loam	CL, SC	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	29-47	13-25
	21-24	Clay, silty clay	CH, CL	A-7-6	0-5	0-10	85-95	80-95	80-90	70-90	50-68	29-41
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
914E:												
Winneshiek-----	0-8	Loam	CL	A-7-6, A-6	0	0	100	95-100	85-95	55-70	33-44	11-18
	8-16	Loam	CL, SC	A-6	0	2-5	90-95	80-95	80-90	50-65	29-39	13-19
	16-21	Loam, clay loam	CL, SC	A-7-6, A-6	0	2-5	90-95	80-95	80-90	50-65	29-47	13-25
	21-24	Clay, silty clay	CH, CL	A-7-6	0-5	0-10	85-95	80-95	80-90	70-90	50-68	29-41
	24-80	Bedrock	---	---	---	---	---	---	---	---	---	---
926:												
Canoe, rarely flooded-----	0-8	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	33-41	11-16
	8-23	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-41	13-19
	23-30	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-41	13-19
	30-49	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	27-42	12-21
	49-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	27-42	12-21
	60-72	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	27-42	12-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
965C2: Dubuque, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	28-41	9-18
	8-22	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	36-47	18-25
	22-27	Clay, silty clay	CL, CH	A-7-6	0	2-10	85-95	80-90	70-85	65-85	50-67	29-41
	27-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
965D2: Dubuque, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-16	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-39	9-18
	16-22	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	36-47	18-25
	22-27	Clay, silty clay	CL, CH	A-7-6	0	2-10	85-95	80-90	70-85	65-85	50-67	29-41
27-80	Bedrock	---	---	---	---	---	---	---	---	---	---	
Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
965E2: Dubuque, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	28-41	9-18
	8-16	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-39	9-18
	16-22	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	36-47	18-25
	22-27	Clay, silty clay	CL, CH	A-7-6	0	2-10	85-95	80-90	70-85	65-85	50-67	29-41
	27-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
965G: Dubuque-----	0-3	Silt loam	CL	A-7-6, A-4, A-6	0	0	100	100	100	95-100	29-42	9-18
	3-11	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-39	9-18
	11-16	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	26-39	9-18
	16-22	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	36-47	18-25
	22-27	Clay, silty clay	CH	A-7-6	0	2-10	85-95	80-90	70-85	65-85	50-67	29-41
27-80	Bedrock	---	---	---	---	---	---	---	---	---	---	
Fayette-----	0-3	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	29-42	9-18
	3-11	Silt loam	CL	A-6, A-4	0	0	100	100	100	95-100	24-38	9-18
	11-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
978:												
Festina-----	0-8	Silt loam	CL, ML	A-7-6, A-6	0	0	100	100	100	95-100	34-42	11-16
	8-11	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-41	16-20
	11-20	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	20-32	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	32-65	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	65-80	Silt loam, loamy sand	SC-SM, SC, CL	A-6, A-4, A-2-4	0	0	100	100	70-90	15-70	18-28	4-12
978B:												
Festina-----	0-8	Silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	33-41	11-16
	8-11	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-41	16-20
	11-65	Silt loam	CL	A-6	0	0	100	100	100	95-100	31-37	15-18
	65-80	Silt loam, loamy sand	SC-SM, SC, CL	A-6, A-4, A-2-4	0	0	100	100	70-90	15-70	18-28	4-12
1026:												
Bearpen, rarely flooded-----	0-8	Silt loam	CL, CL-ML	A-7-6, A-4, A-6	0	0	100	100	85-100	80-95	22-43	6-17
	8-18	Silt loam	CL, CL-ML	A-4, A-7-6, A-6	0	0	100	100	85-100	80-95	22-43	6-17
	18-41	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	85-100	80-95	27-42	12-21
	41-50	Stratified silty clay loam to sandy loam	CL, SC-SM	A-2-4, A-7-6, A-6	0	0	100	100	55-95	30-80	20-41	6-21
	50-60	Stratified silty clay loam to sandy loam	CL, SC-SM	A-7-6, A-2-4, A-4	0	0	100	100	55-95	30-80	20-41	6-21
1084:												
Bearpen, rarely flooded, overwash-----	0-8	Silt loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	80-95	22-43	6-17
	8-18	Silt loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	85-100	80-95	22-43	6-17
	18-41	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	85-100	80-95	27-42	12-21
	41-50	Stratified silty clay loam to sandy loam	CL, SC-SM	A-2-4, A-7-6, A-6	0	0	100	100	55-95	30-80	20-41	6-21
	50-60	Stratified silty clay loam to sandy loam	CL, SC-SM	A-7-6, A-2-4, A-4	0	0	100	100	55-95	30-80	20-41	6-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1084: Lawson, rarely flooded, overwash-----	0-8	Silt loam	ML	A-7-5, A-6, A-4	0	0	100	100	90-100	85-100	29-49	5-18
	8-30	Silt loam	ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	29-49	5-18
	30-40	Silty clay loam, silt loam	MH, CL-ML, ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	27-54	6-20
	40-60	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-100	29-48	12-21
1152: Marshan, rarely flooded-----	0-8	Clay loam, loam, silty clay loam	MH, ML	A-7-5, A-7-6	0	0	94-100	89-100	80-100	69-88	45-57	17-24
	8-14	Silty clay loam, loam, clay loam	CL, MH	A-7-6, A-6	0	0	94-100	89-100	84-100	74-93	39-55	17-25
	14-18	Silty clay loam, loam, clay loam	CL, CH	A-7-6, A-6	0	0	95-100	90-100	84-100	75-93	37-51	17-25
	18-23	Silty clay loam, loam, clay loam	CL	A-7-6, A-6	0	0	95-100	90-100	84-100	75-93	36-47	17-25
	23-30	Loam, clay loam, sandy loam	CL, SC	A-6, A-7-6	0	0	95-100	71-100	59-96	43-74	28-42	12-21
	30-40	Sand, gravelly sand	SP-SM, SP	A-3, A-2-4	0	0-3	90-95	70-90	53-72	4-10	0-17	NP-2
	40-60	Gravelly sand, sand	SP-SM, SP	A-1-b, A-1-a, A-2-4	0	0-3	73-95	25-90	19-72	2-10	0-17	NP-2
1489B: Lawson, frequently flooded-----	0-8	Silt loam	ML	A-7-5, A-6, A-4	0	0	100	100	90-100	85-100	29-49	5-18
	8-30	Silt loam	ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	29-49	5-18
	30-40	Silty clay loam, silt loam	MH, CL-ML, ML	A-7-5, A-4, A-6	0	0	100	100	90-100	85-100	27-54	6-20
	40-60	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-100	29-48	12-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1489B: Ossian, frequently flooded-----	0-8	Silt loam	ML, MH	A-7-5, A-7-6	0	0	100	100	100	95-100	42-51	14-18
	8-15	Silt loam	ML, MH	A-7-5, A-7-6	0	0	100	100	100	95-100	42-51	14-18
	15-23	Silt loam	ML, CL	A-7-5, A-7-6, A-6	0	0	100	100	100	95-100	38-49	15-18
	23-66	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-48	13-21
	66-80	Silty clay loam, silt loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	31-48	13-21
1763E2: Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-7-6, A-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
Exette, moderately eroded-----	0-8	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	30-41	12-18
	8-11	Silt loam	CL	A-6	0	0	100	100	100	95-100	28-40	12-18
	11-33	Silt loam	CL	A-6	0	0	100	100	100	95-100	27-38	12-19
	33-60	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	24-30	9-13
1763F2: Fayette, moderately eroded-----	0-8	Silt loam	CL	A-7-6, A-6, A-4	0	0	100	100	100	95-100	28-41	9-18
	8-26	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	34-44	16-23
	26-47	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21
	47-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	29-41	13-21

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1763F2: Exette, moderately eroded-----	0-8	Silt loam	CL	A-6, A-7-6	0	0	100	100	100	95-100	30-41	12-18
	8-11	Silt loam	CL	A-6	0	0	100	100	100	95-100	28-40	12-18
	11-33	Silt loam	CL	A-6	0	0	100	100	100	95-100	27-38	12-19
	33-60	Silt loam	CL	A-4, A-6	0	0	100	100	100	95-100	24-30	9-13
1936: Udifluvents, channeled, frequently flooded-----	0-7	Fine sandy loam	SC-SM, SM, CL	A-4, A-6	0	0	100	95-100	70-90	40-55	18-32	2-12
	7-44	Stratified sandy loam to silt loam	SC-SM, SP-SM, CL	A-2-4, A-4, A-6	0	0	100	95-100	70-95	10-70	16-28	2-12
	44-80	Stratified sand to loamy sand	SC-SM, SP, SC	A-1-b, A-4, A-2-4	0	0-5	90-95	85-95	30-75	3-50	0-26	NP-9
Spillville, channeled, frequently flooded-----	0-20	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	20-54	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	54-80	Sandy loam, sandy clay loam, loam	CL, SC	A-6, A-2-4	0	0	100	95-100	80-90	35-75	28-40	9-16
2486: Spillville, occasionally flooded-----	0-8	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	8-20	Loam	ML	A-7-6, A-6	0	0	100	95-100	85-95	60-80	36-46	11-18
	20-54	Loam	ML, CL	A-7-6, A-6	0	0	100	95-100	85-95	60-80	34-46	11-18
	54-80	Sandy loam, sandy clay loam, loam	CL, SC	A-6, A-2-4	0	0	100	95-100	80-90	35-75	28-40	9-16
Waukee-----	0-8	Silt loam, loam	SC, ML, CL	A-7-6, A-6	0	0	100	90-100	70-90	50-75	34-42	11-16
	8-16	Silt loam, loam	SC, CL	A-6	0	0	100	90-100	70-90	50-75	32-40	12-16
	16-20	Loam, sandy clay loam	CL, SC	A-6, A-7-6	0	0-3	90-100	90-95	65-85	40-60	28-41	12-19
	20-35	Sandy clay loam, loam	CL, SC	A-6, A-7-6	0	0-3	90-100	90-95	65-85	40-60	28-41	12-19
	35-44	Gravelly loamy coarse sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4
	44-66	Gravelly loamy coarse sand, gravelly sand	SM, SC-SM, SP	A-1-b	0-5	0-10	60-90	60-80	20-40	3-25	0-20	NP-4

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
2551: Calamine-----	0-8	Silty clay loam, silt loam, loam	ML	A-7-5, A-7-6	0	0	100	100	96-100	85-94	45-56	17-24
	8-20	Silty clay loam, silt loam, loam	ML	A-7-5, A-7-6	0	0	100	100	96-100	85-94	45-56	17-24
	20-27	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	97-100	86-94	38-48	19-25
	27-34	Silty clay, silty clay loam	CH, CL	A-7-6	0	0	100	100	93-100	88-100	46-62	25-37
	34-46	Silty clay	CH	A-7-6	0	0	100	100	97-100	92-100	50-62	29-37
	46-60	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Jacwin-----	0-8	Silty clay loam, loam, silt loam	SM, MH, ML	A-7-6, A-7-5	0	0	100	100	90-95	50-80	44-54	16-22
	8-13	Silty clay loam, loam, silt loam	SM, MH, ML	A-7-5, A-7-6	0	0	100	100	90-95	50-80	44-54	16-22
	13-24	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7-6	0	0-5	95-100	90-95	85-95	45-65	31-46	13-22
	24-37	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	55-73	33-45
	37-80	Bedrock	---	---	---	---	---	---	---	---	---	---
2671: Ion, occasionally flooded-----	0-8	Silt loam	ML, CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-36	6-11
	8-36	Stratified silt loam	ML, CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-36	6-11
	36-60	Silt loam	CL-ML, CL	A-7-6, A-6	0	0	100	100	100	90-100	28-40	7-15
Eitzen, occasionally flooded-----	0-8	Silt loam	CL	A-6, A-7-6	0	0	100	98-100	92-100	75-100	32-43	12-17
	8-25	Stratified silt loam	CL	A-6	0	0	100	98-100	92-100	75-100	29-39	12-17
	25-48	Silt loam	ML, CL	A-6, A-7-6	0	0	100	98-100	92-100	85-95	32-45	12-18
	48-66	Silt loam, loam	CL	A-6, A-7-6	0	0	100	90-100	85-100	80-95	29-41	12-19
	66-72	Loam, silt loam	CL	A-6, A-7-6	0	0	100	90-100	85-100	80-95	29-41	12-19
5010. Pits, sand and gravel												
5030. Pits, limestone quarries												

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
5040, 5080. Udorthents												
AW. Animal waste lagoon												
SL. Sewage lagoon												
W. Water												

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.

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 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 (33kPa or 10kPa) 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.

Permeability 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 (33kPa or 10kPa 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

(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	Pct. of map unit	Depth In	Clay Pct	Moist bulk density g/cc	Permea- bility In/hr	Available water capacity In/in	Linear extensi- bility Pct	Organic matter Pct	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
27B: Terril-----	75	0-8	18-26	1.35-1.40	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
		8-36	15-30	1.45-1.70	0.6-2	0.16-0.18	0.0-4.2	2.5-4.0	.32	.32			
		36-60	15-30	1.45-1.70	0.6-2	0.16-0.18	0.0-4.2	0.0-1.0	.32	.32			
41: Sparta-----	100	0-8	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
		8-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
		15-72	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
		72-80	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
41B: Sparta-----	100	0-8	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
		8-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
		15-72	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
		72-80	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
41D: Sparta-----	100	0-8	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	1.0-2.0	.17	.17	5	2	134
		8-15	3-10	1.20-1.40	2-6	0.09-0.12	0.0-0.0	0.5-1.0	.17	.17			
		15-72	1-8	1.40-1.60	6-20	0.05-0.11	0.0-0.0	0.0-0.5	.15	.15			
		72-80	0-5	1.50-1.70	6-20	0.04-0.07	0.0-0.0	0.0-0.5	.15	.15			
63B: Chelsea-----	85	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
		8-36	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
		36-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
63D: Chelsea-----	75	0-8	8-15	1.50-1.55	6-20	0.10-0.15	0.0-0.0	0.5-1.5	.17	.17	5	2	134
		8-32	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
		32-70	5-10	1.55-1.70	6-20	0.06-0.08	0.0-0.0	0.0-0.5	.17	.17			
84: Clyde-----	75	0-8	20-32	1.35-1.40	0.6-2	0.21-0.23	1.0-4.8	6.0-9.0	.28	.28	5	7	38
		8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
		17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
		23-28	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
		28-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
		41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
		44-62	20-28	1.65-1.75	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
		62-66	20-28	1.80-1.90	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
85: Eitzen, occasionally flooded-----	75	In	Pct	g/cc	In/hr	In/in	Pct	Pct						
		0-8	18-25	1.35-1.45	0.6-2	0.22-0.24	0.4-2.6	2.0-4.0	.28	.28	5	6	48	
		8-25	18-25	1.35-1.45	0.6-2	0.22-0.24	0.4-2.6	1.0-2.0	.28	.28				
		25-48	18-27	1.30-1.45	0.6-2	0.20-0.22	0.4-3.2	2.0-4.0	.28	.28				
		48-55	18-27	1.40-1.65	0.6-2	0.18-0.20	0.4-3.2	1.0-2.0	.28	.28				
		55-60	18-27	1.40-1.65	0.6-2	0.18-0.20	0.4-3.2	1.0-2.0	.28	.28				
98: Huntsville, occasionally flooded	100	0-8	18-27	1.15-1.35	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48	
		8-27	18-27	1.15-1.35	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28				
		27-52	18-27	1.20-1.40	0.6-2	0.20-0.22	0.4-3.2	0.2-0.5	.28	.28				
		52-60	18-27	1.20-1.40	0.6-2	0.20-0.22	0.4-3.2	0.2-0.5	.28	.28				
98B: Huntsville, occasionally flooded	100	0-8	18-27	1.15-1.35	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48	
		8-27	18-27	1.15-1.35	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28				
		27-52	18-27	1.20-1.40	0.6-2	0.20-0.22	0.4-3.2	0.2-0.5	.28	.28				
		52-60	18-27	1.20-1.40	0.6-2	0.20-0.22	0.4-3.2	0.2-0.5	.28	.28				
109B: Backbone-----	80	0-8	8-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.0	.20	.20	3	3	86	
		8-17	8-18	1.50-1.60	2-6	0.11-0.13	0.0-0.4	0.5-1.0	.20	.20				
		17-24	12-18	1.55-1.65	2-6	0.11-0.13	0.0-0.4	0.5-1.0	.20	.20				
		24-30	20-40	1.50-1.60	0.06-0.2	0.12-0.15	1.0-7.3	0.0-0.5	.37	.37				
		30-80	---	---	2-20	---	---	---	---	---				
109C: Backbone-----	75	0-8	8-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.0	.20	.20	3	3	86	
		8-24	12-18	1.55-1.65	2-6	0.11-0.13	0.0-0.4	0.5-1.0	.20	.20				
		24-30	20-40	1.50-1.60	0.06-0.2	0.12-0.15	1.0-7.3	0.0-0.5	.37	.37				
		30-80	---	---	2-20	---	---	---	---	---				
109D: Backbone-----	80	0-8	8-18	1.50-1.55	2-6	0.12-0.14	0.0-0.4	1.0-2.0	.20	.20	3	3	86	
		8-24	12-18	1.55-1.65	2-6	0.11-0.13	0.0-0.4	0.5-1.0	.20	.20				
		24-30	20-40	1.50-1.60	0.06-0.2	0.12-0.15	1.0-7.3	0.0-0.5	.37	.37				
		30-80	---	---	2-20	---	---	---	---	---				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
135: Coland, occasionally flooded-----	90	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48
		8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24			
		32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	2.0-4.0	.24	.24			
		40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
		44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28			
		52-66	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28			
136B: Ankeny-----	100	0-8	10-18	1.50-1.55	2-6	0.16-0.18	0.0-0.4	2.0-3.0	.20	.20	4	3	86
		8-38	10-18	1.50-1.55	2-6	0.16-0.18	0.0-0.4	2.0-3.0	.20	.20			
		38-44	10-16	1.55-1.65	2-6	0.15-0.17	0.0-0.0	0.5-1.0	.20	.20			
		44-60	2-10	1.65-1.75	6-20	0.12-0.14	0.0-0.0	0.0-0.5	.20	.20			
162B: Downs-----	100	0-8	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.5-3.5	.32	.32	5	6	48
		8-12	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		12-17	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		17-33	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		33-39	24-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		39-48	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		48-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
162C: Downs-----	95	0-8	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.5-3.5	.32	.32	5	6	48
		8-12	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		12-17	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		17-33	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		33-48	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		48-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
162D: Downs-----	80	0-8	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.5-3.5	.32	.32	5	6	48
		8-12	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		12-17	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		17-33	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		33-48	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		48-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind
									Kw	Kf	T	erodi- bility group	erodi- bility index
162E2: Downs, moderately eroded-----	80	0-7	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.0-3.0	.32	.32	5	6	48
		7-10	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		10-26	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		26-37	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		37-42	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		42-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
163B: Fayette-----	100	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	6	48
		8-11	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.32	.32			
		11-14	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.32	.32			
		14-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-34	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		34-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-73	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
163C2: Fayette, moderately eroded-----	90	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
163D2: Fayette, moderately eroded-----	80	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
163E2: Fayette, moderately eroded-----	75	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
163F: Fayette-----	80	0-3	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	6	48
		3-11	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.32	.32			
		11-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
163G: Fayette-----	95	0-3	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	6	48
		3-11	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.32	.32			
		11-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
175B: Dickinson-----	85	0-8	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
		8-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
		18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
		30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
		36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
177C2: Saude, moderately eroded-----	90	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.5-3.5	.24	.24	4	6	48
		8-24	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
		24-28	12-18	1.40-1.50	0.6-6	0.15-0.19	0.0-0.4	0.5-1.0	.24	.24			
		28-36	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
		36-60	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.20			
178: Waukee-----	85	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
		8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
		16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
		20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
		35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
		44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
178B: Waukee-----	75	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48
		8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
		16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
		20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28			
		35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
		44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17			
196: Volney, occasionally flooded-----	95	0-30	18-24	1.40-1.55	2-6	0.13-0.16	0.4-2.3	3.0-5.0	.24	.43	4	4L	56
		30-80	12-25	1.70-1.90	20-20	0.02-0.08	0.0-2.6	0.0-1.0	.24	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
196+: Volney, occasionally flooded, overwash----	95	0-8	10-18	1.55-1.65	0.6-2	0.18-0.22	0.0-0.4	0.0-2.0	.37	.37	4	5	86	
		8-30	18-24	1.40-1.55	2-6	0.13-0.16	0.4-2.3	3.0-5.0	.24	.43				
		30-80	12-25	1.70-1.90	20-20	0.02-0.08	0.0-2.6	0.0-1.0	.24	.43				
196B: Volney, rarely flooded	95	0-30	18-24	1.40-1.55	2-6	0.13-0.16	0.4-2.3	3.0-5.0	.24	.43	4	4L	56	
		30-80	12-25	1.70-1.90	20-20	0.02-0.08	0.0-2.6	0.0-1.0	.24	.43				
198B: Floyd-----	90	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	6	48	
		8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24				
		24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32				
		33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32				
		41-50	18-30	1.65-1.75	0.06-0.2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32				
		50-60	18-30	1.80-1.90	0.06-0.2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32				
221: Klossner-----	75	0-10	25-30	0.25-0.45	0.2-6	0.35-0.45	---	20-50	.32	.32	5	2	134	
		10-26	25-30	0.25-0.45	0.2-6	0.35-0.45	---	20-50	.32	.32				
		26-48	7-35	1.45-1.75	0.2-2	0.14-0.22	0.0-2.3	0.5-1.0	.37	.37				
		48-80	7-35	1.45-1.75	0.2-2	0.14-0.22	0.0-2.3	0.0-0.5	.37	.37				
221+: Klossner, occasionally flooded, overwash----	95	0-10	25-30	0.25-0.45	0.2-6	0.35-0.45	---	20-50	.32	.32	5	2	134	
		10-26	25-30	0.25-0.45	0.2-6	0.35-0.45	---	20-50	.32	.32				
		26-48	7-35	1.45-1.75	0.2-2	0.14-0.22	0.0-2.3	0.5-1.0	.37	.37				
		48-80	7-35	1.45-1.75	0.2-2	0.14-0.22	0.0-2.3	0.0-0.5	.37	.37				
235: Turlin, rarely flooded	55	0-9	18-26	1.45-1.55	0.6-2	0.20-0.22	0.4-2.9	4.5-5.5	.24	.24	4	6	48	
		9-34	18-26	1.45-1.55	0.6-2	0.20-0.22	0.4-2.9	4.5-5.5	.24	.24				
		34-41	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	2.0-3.0	.28	.28				
		41-68	20-28	1.55-1.65	0.6-2	0.17-0.19	1.0-3.5	2.0-3.0	.28	.28				
		68-80	8-18	1.65-1.70	6-20	0.08-0.17	0.0-0.4	0.0-1.0	.24	.24				
Coland, occasionally flooded-----	25	0-8	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	5.0-7.0	.24	.24	5	6	48	
		8-32	27-35	1.40-1.50	0.6-2	0.20-0.22	3.2-5.8	3.0-6.0	.24	.24				
		32-40	25-35	1.40-1.50	0.6-2	0.20-0.22	2.6-5.8	2.0-4.0	.24	.24				
		40-44	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28				
		44-52	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-2.0	.28	.28				
		52-60	12-28	1.50-1.65	0.6-6	0.13-0.17	0.0-3.5	0.0-1.0	.28	.28				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
241B:		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
Lilah-----	70	0-8	5-13	1.50-1.55	2-6	0.11-0.13	0.0-0.0	1.0-2.0	.20	.20	3	3	86
		8-15	10-15	1.55-1.65	2-6	0.10-0.12	0.0-0.0	0.0-0.5	.20	.20			
		15-28	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		28-39	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		39-60	2-6	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
Dickinson-----	20	0-8	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
		8-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
		18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
		30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
		36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
241C:													
Lilah-----	60	0-8	5-13	1.50-1.55	2-6	0.11-0.13	0.0-0.0	1.0-2.0	.20	.20	3	3	86
		8-15	10-15	1.55-1.65	2-6	0.10-0.12	0.0-0.0	0.0-0.5	.20	.20			
		15-28	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		28-39	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		39-60	2-6	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
Dickinson-----	25	0-8	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
		8-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
		18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
		30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
		36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
241D:													
Lilah-----	60	0-8	5-13	1.50-1.55	2-6	0.11-0.13	0.0-0.0	1.0-2.0	.20	.20	3	3	86
		8-15	10-15	1.55-1.65	2-6	0.10-0.12	0.0-0.0	0.0-0.5	.20	.20			
		15-28	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		28-39	2-10	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		39-60	2-6	1.55-1.80	20-101	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
Dickinson-----	40	0-8	12-18	1.50-1.55	2-6	0.12-0.15	0.0-0.4	1.5-2.5	.20	.20	4	3	86
		8-18	10-18	1.45-1.55	2-6	0.12-0.15	0.0-0.4	0.5-2.5	.20	.20			
		18-30	10-18	1.45-1.55	6-20	0.12-0.15	0.0-0.4	0.0-0.5	.20	.20			
		30-36	5-10	1.55-1.65	6-20	0.08-0.10	0.0-0.0	0.0-0.5	.20	.20			
		36-60	5-10	1.60-1.70	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
285B:													
Burkhardt-----	75	0-8	5-13	1.35-1.55	2-6	0.11-0.15	0.0-0.0	1.5-2.5	.20	.20	2	3	86
		8-17	5-13	1.35-1.55	2-6	0.11-0.15	0.0-0.0	1.5-2.5	.20	.20			
		17-19	1-6	1.50-1.80	6-101	0.03-0.11	0.0-0.0	0.0-0.5	.10	.15			
		19-29	1-6	1.50-1.80	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			
		29-60	1-6	1.50-1.80	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
285F:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Burkhardt-----	75	0-10	5-13	1.35-1.55	2-6	0.11-0.15	0.0-0.0	1.5-2.5	.20	.20	2	3	86	
		10-17	5-13	1.35-1.55	2-6	0.11-0.15	0.0-0.0	1.5-2.5	.20	.20				
		17-19	1-6	1.50-1.80	6-101	0.03-0.11	0.0-0.0	0.0-0.5	.10	.15				
		19-29	1-6	1.50-1.80	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10				
		29-60	1-6	1.50-1.80	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.10	.10				
291B:														
Atterberry-----	100	0-8	15-26	1.35-1.55	0.6-2	0.22-0.25	0.0-2.9	3.0-4.0	.32	.32	5	6	48	
		8-17	15-26	1.40-1.60	0.6-2	0.21-0.24	0.0-2.9	0.5-1.0	.32	.32				
		17-24	24-32	1.40-1.60	0.6-2	0.14-0.24	2.3-4.8	0.1-0.5	.43	.43				
		24-48	24-32	1.40-1.60	0.6-2	0.14-0.24	2.3-4.8	0.1-0.5	.43	.43				
		48-60	20-30	1.40-1.65	0.6-2	0.14-0.24	1.0-4.2	0.1-0.5	.43	.43				
302B:														
Coggon-----	80	0-3	18-24	1.45-1.50	0.6-2	0.18-0.20	0.4-2.3	2.0-3.0	.28	.28	5	6	48	
		3-11	18-24	1.45-1.50	0.6-2	0.18-0.20	0.4-2.3	0.0-1.0	.28	.28				
		11-17	22-28	1.50-1.70	0.6-2	0.17-0.19	1.6-2.6	0.5-1.0	.32	.32				
		17-31	18-35	1.65-1.75	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
		31-44	18-35	1.65-1.75	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
		44-62	18-35	1.65-1.75	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
		62-80	18-35	1.80-1.90	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
302C:														
Coggon-----	75	0-3	18-24	1.45-1.50	0.6-2	0.18-0.20	0.4-2.3	2.0-3.0	.28	.28	5	6	48	
		3-11	18-24	1.45-1.50	0.6-2	0.18-0.20	0.4-2.3	0.0-1.0	.28	.28				
		11-17	22-28	1.50-1.70	0.6-2	0.17-0.19	1.6-3.5	0.5-1.0	.32	.32				
		17-24	18-35	1.65-1.75	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
		24-60	18-35	1.80-1.90	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
302C2:														
Coggon, moderately eroded-----	80	0-8	18-24	1.45-1.50	0.6-2	0.18-0.20	0.4-2.3	1.5-2.5	.28	.28	5	6	48	
		8-11	22-28	1.50-1.70	0.6-2	0.17-0.19	1.6-3.5	0.5-1.0	.32	.32				
		11-24	18-35	1.65-1.75	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
		24-60	18-35	1.80-1.90	0.06-0.2	0.17-0.19	0.4-5.8	0.0-0.5	.32	.32				
320:														
Arenzville, occasionally flooded	100	0-10	10-18	1.20-1.55	0.6-2	0.20-0.24	0.0-0.4	1.5-2.5	.37	.37	5	5	56	
		10-25	10-18	1.20-1.55	0.6-2	0.20-0.24	0.0-0.4	0.5-1.0	.37	.37				
		25-40	10-30	1.25-1.45	0.6-2	0.18-0.22	0.0-4.2	1.0-3.0	.37	.37				
		40-60	10-18	1.20-1.55	0.6-2	0.20-0.24	0.0-0.4	1.0-3.0	.37	.37				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
391B: Clyde-----	45	0-8	20-32	1.35-1.40	0.6-2	0.21-0.23	1.0-4.8	6.0-9.0	.28	.28	5	7	38
		8-17	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	2.0-6.0	.28	.28			
		17-23	28-32	1.35-1.40	0.6-2	0.21-0.23	3.5-4.8	1.0-4.0	.28	.28			
		23-41	22-30	1.45-1.65	0.6-2	0.18-0.20	1.6-4.2	0.5-2.0	.37	.37			
		41-44	10-15	1.60-1.70	0.6-2	0.11-0.13	0.0-0.0	0.5-1.0	.37	.37			
		44-62	20-28	1.65-1.75	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
		62-66	20-28	1.80-1.90	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.37	.37			
Floyd-----	40	0-8	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	5.0-6.0	.24	.24	5	6	48
		8-24	20-28	1.35-1.40	0.6-2	0.20-0.22	1.0-3.5	2.0-5.0	.24	.24			
		24-33	18-24	1.40-1.60	0.6-2	0.16-0.18	0.4-2.3	1.0-2.0	.32	.32			
		33-41	6-24	1.35-1.40	2-6	0.11-0.13	0.0-2.3	0.5-1.0	.32	.32			
		41-50	18-30	1.65-1.75	0.06-0.2	0.16-0.18	0.4-4.2	0.0-1.0	.32	.32			
		50-60	18-30	1.80-1.90	0.06-0.2	0.16-0.18	0.4-4.2	0.0-0.5	.32	.32			
394B: Ostrander-----	80	0-8	18-27	1.45-1.55	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48
		8-16	18-27	1.45-1.55	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.28	.28			
		16-24	18-27	1.45-1.55	0.6-2	0.17-0.20	0.4-3.2	1.0-2.0	.28	.28			
		24-30	13-27	1.65-1.75	0.06-0.2	0.17-0.19	0.0-3.2	0.0-1.0	.28	.28			
		30-50	13-27	1.65-1.75	0.06-0.2	0.17-0.19	0.0-3.2	0.0-1.0	.28	.28			
		50-60	18-30	1.80-1.90	0.06-0.2	0.17-0.19	0.4-4.2	0.0-0.5	.37	.37			
394C: Ostrander-----	85	0-8	18-27	1.45-1.55	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48
		8-16	18-27	1.45-1.55	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.28	.28			
		16-24	18-27	1.45-1.55	0.6-2	0.17-0.20	0.4-3.2	1.0-2.0	.28	.28			
		24-50	13-27	1.65-1.75	0.06-0.2	0.17-0.19	0.0-3.2	0.0-1.0	.28	.28			
		50-60	18-30	1.80-1.90	0.06-0.2	0.17-0.19	0.4-4.2	0.0-0.5	.37	.37			
395B: Marquis-----	100	0-8	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24	5	6	48
		8-19	18-26	1.40-1.45	0.6-2	0.20-0.22	0.4-2.9	3.0-4.0	.24	.24			
		19-24	20-30	1.45-1.65	0.6-2	0.17-0.19	1.0-4.2	1.0-2.0	.28	.28			
		24-54	20-30	1.65-1.75	0.06-0.2	0.17-0.19	1.0-4.2	0.0-1.0	.37	.37			
		54-80	20-30	1.80-1.90	0.06-0.2	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37			
444: Jacwin-----	80	0-8	20-32	1.35-1.45	0.6-2	0.20-0.22	1.0-4.8	5.0-6.0	.28	.28	4	7	38
		8-13	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	5.0-6.0	.28	.28			
		13-24	20-32	1.50-1.60	0.6-2	0.17-0.19	1.0-4.8	1.0-2.0	.28	.28			
		24-37	45-60	1.50-1.60	0.0015-0.06	0.12-0.14	8.9-13.7	0.0-1.0	.28	.28			
		37-80	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
444B: Jacwin-----	75	In	Pct	g/cc	In/hr	In/in	Pct	Pct						
		0-8	20-32	1.35-1.45	0.6-2	0.20-0.22	1.0-4.8	4.5-5.5	.28	.28	4	6	48	
		8-13	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	4.5-5.5	.28	.28				
		13-24	20-32	1.50-1.60	0.6-2	0.17-0.19	1.0-4.8	1.0-2.0	.28	.28				
		24-37	45-60	1.50-1.60	0.0015-0.06	0.12-0.14	8.9-13.7	0.0-1.0	.28	.28				
		37-80	---	---	---	---	---	---	---	---				
444C: Jacwin-----	75	0-8	20-32	1.35-1.45	0.6-2	0.20-0.22	1.0-4.8	4.5-5.5	.28	.28	4	6	48	
		8-13	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	4.5-5.5	.28	.28				
		13-24	20-32	1.50-1.60	0.6-2	0.17-0.19	1.0-4.8	1.0-2.0	.28	.28				
		24-37	45-60	1.50-1.60	0.0015-0.06	0.12-0.14	8.9-13.7	0.0-1.0	.28	.28				
		37-80	---	---	---	---	---	---	---	---				
468B: Dunkerton-----	70	0-8	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.5	.20	.20	5	3	86	
		8-15	5-18	1.45-1.50	2-6	0.13-0.15	0.0-0.4	0.5-1.0	.20	.20				
		15-25	10-22	1.45-1.50	2-6	0.13-0.15	0.0-1.6	0.0-0.5	.20	.20				
		25-36	20-30	1.65-1.75	0.06-0.2	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37				
		36-49	20-30	1.80-1.90	0.06-0.2	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37				
		49-80	20-30	1.80-1.90	0.06-0.2	0.17-0.19	1.0-4.2	0.0-0.5	.37	.37				
471: Oran-----	80	0-8	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	3.0-4.0	.24	.24	5	6	48	
		8-13	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.0-1.5	.24	.24				
		13-18	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.0-1.5	.24	.24				
		18-45	22-30	1.65-1.75	0.06-0.2	0.17-0.19	1.6-4.2	0.0-1.0	.32	.32				
		45-80	22-30	1.80-1.90	0.06-0.2	0.17-0.19	1.6-4.2	0.0-0.5	.37	.37				
471B: Oran-----	90	0-8	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	2.5-3.5	.24	.24	5	6	48	
		8-13	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.0-1.5	.24	.24				
		13-18	16-24	1.40-1.45	0.6-2	0.18-0.20	0.0-2.3	0.0-1.5	.24	.24				
		18-45	22-30	1.65-1.75	0.06-0.2	0.17-0.19	1.6-4.2	0.0-1.0	.32	.32				
		45-80	22-30	1.80-1.90	0.06-0.2	0.17-0.19	1.6-4.2	0.0-0.5	.37	.37				
480B: Orwood-----	100	0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	2.5-3.5	.28	.28	5	6	48	
		8-10	15-27	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28				
		10-22	18-30	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28				
		22-55	18-30	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43				
		55-80	15-27	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
480C2: Orwood, moderately eroded-----	100	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
		0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	2.0-3.0	.28	.28	5	6	48
		8-22	18-24	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28			
		22-50	22-27	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43			
		50-80	18-26	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43			
480D2: Orwood, moderately eroded-----	85	0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	2.0-3.0	.28	.28	5	6	48
		8-22	18-24	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28			
		22-50	22-27	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43			
		50-80	18-26	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43			
480E2: Orwood, moderately eroded-----	85	0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	2.0-3.0	.28	.28	5	6	48
		8-22	18-24	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28			
		22-50	22-27	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43			
		50-80	18-26	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43			
480E3: Orwood, severely eroded-----	90	0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	1.0-2.0	.28	.28	4	6	48
		8-45	22-27	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43			
		45-80	18-26	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43			
480F2: Orwood, moderately eroded-----	85	0-8	15-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.3	2.0-3.0	.28	.28	5	6	48
		8-22	18-24	1.35-1.40	0.6-2	0.20-0.22	0.4-2.3	1.0-2.0	.28	.28			
		22-50	22-27	1.40-1.45	0.6-2	0.18-0.22	1.6-3.2	1.0-2.0	.43	.43			
		50-80	18-26	1.45-1.50	0.6-2	0.20-0.22	0.4-2.9	0.0-0.5	.43	.43			
482B: Racine-----	80	0-8	18-27	1.35-1.45	0.6-2	0.22-0.24	0.4-3.2	2.5-3.5	.32	.32	5	6	48
		8-12	18-27	1.35-1.45	0.6-2	0.22-0.24	0.4-3.2	1.0-3.0	.32	.32			
		12-28	22-32	1.40-1.50	0.6-2	0.20-0.22	1.6-4.8	0.5-1.5	.32	.32			
		28-46	18-32	1.65-1.75	0.06-0.2	0.15-0.19	0.4-4.8	0.2-0.8	.32	.32			
		46-65	18-30	1.80-1.90	0.06-0.2	0.16-0.19	0.4-4.2	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
484: Lawson, occasionally flooded-----	90	In	Pct	g/cc	In/hr	In/in	Pct	Pct						
		0-8	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28	5	5	56	
		8-30	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28				
		30-40	10-30	1.20-1.55	0.6-2	0.18-0.22	0.0-4.2	3.0-7.0	.28	.28				
		40-60	18-30	1.55-1.65	0.6-2	0.18-0.20	0.4-4.2	1.0-4.0	.43	.43				
485: Spillville, occasionally flooded	100	0-20	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48	
		20-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24				
		54-80	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	2.0-3.0	.28	.28				
487B: Otter, frequently flooded-----	50	0-8	18-27	1.10-1.25	0.6-2	0.22-0.24	0.4-3.2	3.5-5.5	.28	.28	5	6	48	
		8-27	18-27	1.10-1.25	0.6-2	0.22-0.24	0.4-3.2	3.5-5.5	.28	.28				
		27-34	18-30	1.20-1.45	0.6-2	0.17-0.22	0.4-4.2	1.0-3.0	.43	.43				
		34-41	15-28	1.30-1.55	0.6-2	0.15-0.20	0.0-3.5	0.5-2.0	.43	.43				
		41-65	15-28	1.30-1.55	0.6-2	0.15-0.20	0.0-3.5	0.5-2.0	.43	.43				
Worthen-----	40	0-8	15-22	1.20-1.40	0.6-2	0.22-0.24	0.0-1.6	3.5-4.5	.32	.32	5	6	48	
		8-20	15-22	1.20-1.40	0.6-2	0.22-0.24	0.0-1.6	3.5-4.5	.32	.32				
		20-29	15-22	1.20-1.40	0.6-2	0.22-0.24	0.0-1.6	3.5-4.5	.32	.32				
		29-64	18-24	1.20-1.40	0.6-2	0.20-0.22	0.4-2.3	0.2-1.0	.43	.43				
		64-80	12-20	1.20-1.40	0.6-2	0.20-0.22	0.0-1.0	0.2-1.0	.43	.43				
489: Ossian, occasionally flooded-----	95	0-8	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	5.0-7.0	.28	.28	5	6	48	
		8-15	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	5.0-7.0	.28	.28				
		15-23	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	3.0-6.0	.28	.28				
		23-32	20-30	1.30-1.40	0.6-2	0.20-0.22	1.0-4.2	1.0-4.0	.28	.28				
		32-66	20-30	1.30-1.40	0.6-2	0.20-0.22	1.0-4.2	1.0-4.0	.28	.28				
		66-80	20-30	1.30-1.40	0.6-2	0.20-0.22	1.0-4.2	1.0-4.0	.28	.28				
491D2: Renova, moderately eroded-----	80	0-8	20-27	1.30-1.40	0.6-2	0.22-0.24	1.0-3.2	1.5-2.5	.37	.37	5	6	48	
		8-19	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	0.0-0.5	.37	.37				
		19-52	18-27	1.65-1.75	0.06-0.2	0.17-0.19	0.4-3.2	0.0-0.5	.37	.37				
		52-60	18-27	1.80-1.90	0.06-0.2	0.17-0.19	0.4-3.2	0.0-0.5	.37	.37				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
491E2: Renova, moderately eroded-----	85	0-8	20-27	1.30-1.40	0.6-2	0.22-0.24	1.0-3.2	1.5-2.5	.37	.37	5	6	48
		8-19	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	0.0-0.5	.37	.37			
		19-52	18-27	1.65-1.75	0.06-0.2	0.17-0.19	0.4-3.2	0.0-0.5	.37	.37			
		52-60	18-27	1.80-1.90	0.06-0.2	0.17-0.19	0.4-3.2	0.0-0.5	.37	.37			
499D: Nordness-----	75	0-4	18-24	1.30-1.35	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.32	.32	1	6	48
		4-7	22-29	1.35-1.45	0.6-2	0.20-0.22	1.6-3.9	0.5-1.0	.32	.32			
		7-13	22-29	1.35-1.45	0.6-2	0.20-0.22	1.6-3.9	0.5-1.0	.32	.32			
		13-16	30-55	1.35-1.60	0.06-0.2	0.12-0.15	4.2-12.1	0.0-0.5	.37	.37			
		16-80	---	---		2-20	---	---	0.0-0.0	---	---		
499G: Nordness-----	75	0-4	18-24	1.30-1.35	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.32	.32	1	6	48
		4-13	22-29	1.35-1.45	0.6-2	0.20-0.22	1.6-3.9	0.5-1.0	.32	.32			
		13-16	30-55	1.35-1.60	0.06-0.2	0.12-0.15	4.2-12.1	0.0-0.5	.37	.37			
		16-80	---	---		2-20	---	---	0.0-0.0	---	---		
512B: Marlean-----	90	0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	3	6	48
		7-9	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24			
		9-12	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.24	.24			
		12-80	18-27	1.40-1.55		2-20	0.13-0.15	0.4-3.2	0.0-0.5	.24	.24		
512C: Marlean-----	75	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	3	6	48
		8-12	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.24	.24			
		12-80	18-27	1.40-1.55		2-20	0.13-0.15	0.4-3.2	0.0-0.5	.24	.24		
512C2: Marlean, moderately eroded-----	75	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.5-3.5	.24	.24	3	6	48
		8-12	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.24	.24			
		12-80	18-27	1.40-1.55		2-20	0.13-0.15	0.4-3.2	0.0-0.5	.24	.24		
512D2: Marlean, moderately eroded-----	75	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.5-3.5	.24	.24	3	6	48
		8-12	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.24	.24			
		12-80	18-27	1.40-1.55		2-20	0.13-0.15	0.4-3.2	0.0-0.5	.24	.24		

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind
									Kw	Kf	T	erodi- bility group	erodi- bility index
512E2: Marlean, moderately eroded-----	80	In 0-8	Pct 18-24	g/cc 1.40-1.45	In/hr 0.6-2	In/in 0.20-0.22	Pct 0.4-2.3	Pct 2.5-3.5	.24	.24	3	6	48
		8-12	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.24	.24			
		12-80	18-27	1.40-1.55	2-20	0.13-0.15	0.4-3.2	0.0-0.5	.24	.24			
582B: Kasson-----	85	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
		8-11	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
		11-20	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
		20-41	20-28	1.65-1.75	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		41-53	20-28	1.80-1.90	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		53-69	20-24	1.80-1.90	0.06-0.2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
		69-80	20-24	1.80-1.90	0.06-0.2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
582C: Kasson-----	95	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	2.5-3.5	.28	.28	5	6	48
		8-10	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
		10-14	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	0.5-1.0	.28	.28			
		14-43	20-28	1.65-1.75	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		43-59	20-28	1.80-1.90	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		59-73	20-24	1.80-1.90	0.06-0.2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
582C2: Kasson, moderately eroded-----	85	0-8	18-25	1.45-1.50	0.6-2	0.19-0.21	0.4-2.6	1.5-2.5	.28	.28	5	6	48
		8-43	20-28	1.65-1.75	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		43-59	20-28	1.80-1.90	0.06-0.2	0.17-0.19	1.0-3.5	0.0-0.5	.28	.28			
		59-73	20-24	1.80-1.90	0.06-0.2	0.17-0.19	1.0-2.3	0.0-0.5	.37	.37			
626: Hayfield-----	75	0-8	18-27	1.30-1.50	0.6-2	0.20-0.24	0.4-3.2	3.0-4.0	.32	.32	4	6	48
		8-13	18-27	1.30-1.50	0.6-2	0.20-0.24	0.4-3.2	0.5-1.0	.32	.32			
		13-29	18-30	1.40-1.55	0.6-2	0.17-0.22	0.4-4.2	0.0-1.0	.32	.32			
		29-80	0-5	1.55-1.65	6-20	0.02-0.04	0.0-0.0	0.0-0.5	.15	.15			
762B: Downs-----	55	0-8	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.5-3.5	.32	.32	5	6	48
		8-12	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		12-17	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		17-33	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		33-48	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		48-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth In	Clay Pct	Moist bulk density g/cc	Permea- bility In/hr	Available water capacity In/in	Linear extensi- bility Pct	Organic matter Pct	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
762B: Tama-----	45	0-8	18-27	1.25-1.30	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48
		8-14	24-32	1.25-1.30	0.6-2	0.22-0.24	2.3-4.8	2.5-3.5	.28	.28			
		14-45	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	1.0-2.0	.43	.43			
		45-60	20-30	1.35-1.40	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
762C: Downs-----	50	0-8	15-26	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	2.5-3.5	.32	.32	5	6	48
		8-12	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		12-17	15-26	1.30-1.35	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.32	.32			
		17-33	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	0.5-1.0	.43	.43			
		33-48	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		48-60	20-30	1.35-1.45	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
Tama-----	50	0-8	18-27	1.25-1.30	0.6-2	0.22-0.24	0.4-3.2	3.0-4.0	.28	.28	5	6	48
		8-14	24-32	1.25-1.30	0.6-2	0.22-0.24	2.3-4.8	2.5-3.5	.28	.28			
		14-45	24-32	1.30-1.35	0.6-2	0.18-0.20	2.3-4.8	1.0-2.0	.43	.43			
		45-60	20-30	1.35-1.40	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
775B: Billett-----	100	0-8	5-15	1.40-1.70	2-6	0.13-0.18	0.0-0.0	1.0-2.0	.20	.20	4	3	86
		8-13	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.5-1.0	.20	.20			
		13-28	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.0-0.5	.15	.15			
		28-41	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		41-47	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		47-52	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
		52-60	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
775C: Billett-----	90	0-8	5-15	1.40-1.70	2-6	0.13-0.18	0.0-0.0	1.0-2.0	.20	.20	4	3	86
		8-13	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.5-1.0	.20	.20			
		13-28	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.0-0.5	.15	.15			
		28-41	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		41-47	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		47-52	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
		52-60	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
775D: Billett-----	90	0-8	5-15	1.40-1.70	2-6	0.13-0.18	0.0-0.0	1.0-2.0	.20	.20	4	3	86
		8-13	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.5-1.0	.20	.20			
		13-28	10-18	1.40-1.70	2-6	0.10-0.15	0.0-0.4	0.0-0.5	.15	.15			
		28-41	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		41-47	8-18	1.50-1.80	2-6	0.05-0.12	0.0-0.4	0.0-0.5	.15	.15			
		47-52	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			
		52-60	2-7	1.60-1.90	6-20	0.02-0.10	0.0-0.0	0.0-0.5	.10	.10			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
782B:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Donnan-----	90	0-8	15-26	1.45-1.50	0.6-2	0.20-0.22	0.0-2.9	2.5-3.5	.28	.28	4	6	48	
		8-13	20-26	1.45-1.50	0.6-2	0.20-0.22	1.0-2.9	0.5-1.0	.28	.28				
		13-18	20-26	1.45-1.50	0.6-2	0.20-0.22	1.0-2.9	0.5-1.0	.28	.28				
		18-24	20-30	1.45-1.55	0.6-2	0.17-0.19	1.0-4.2	0.0-0.5	.28	.28				
		24-34	42-55	1.65-1.80	0.0015-0.06	0.11-0.14	8.0-12.1	0.0-0.5	.28	.28				
		34-48	42-55	1.65-1.80	0.0015-0.06	0.11-0.14	8.0-12.1	0.0-0.5	.28	.28				
		48-60	24-32	1.80-1.90	0.06-0.2	0.17-0.19	2.3-4.8	0.0-0.5	.28	.28				
793:														
Bertrand-----	85	0-8	15-22	1.35-1.60	0.6-2	0.22-0.24	0.0-1.6	2.5-3.5	.37	.37	4	5	56	
		8-44	18-30	1.55-1.65	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.37	.37				
		44-55	5-20	1.55-1.65	0.6-6	0.09-0.22	0.0-1.0	0.0-0.5	.37	.37				
		55-60	1-4	1.55-1.65	6-20	0.05-0.09	0.0-0.0	0.0-0.5	.15	.15				
793B:														
Bertrand-----	100	0-8	15-22	1.35-1.60	0.6-2	0.22-0.24	0.0-1.6	2.0-3.0	.37	.37	4	5	56	
		8-44	18-30	1.55-1.65	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.37	.37				
		44-55	5-20	1.55-1.65	0.6-6	0.09-0.22	0.0-1.0	0.0-0.5	.37	.37				
		55-60	1-4	1.55-1.65	6-20	0.05-0.09	0.0-0.0	0.0-0.5	.15	.15				
806B:														
Whalan-----	80	0-8	18-25	1.30-1.45	0.6-2	0.22-0.24	0.4-2.6	2.0-3.0	.32	.32	3	6	48	
		8-12	18-35	1.40-1.55	0.6-2	0.17-0.19	0.4-5.8	0.5-1.0	.32	.32				
		12-22	18-35	1.40-1.55	0.6-2	0.17-0.19	0.4-5.8	0.5-1.0	.32	.32				
		22-24	35-60	1.35-1.45	0.0015-0.6	0.15-0.19	5.8-13.7	0.0-0.5	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
806C2:														
Whalan, moderately eroded-----	80	0-8	18-25	1.30-1.45	0.6-2	0.22-0.24	0.4-2.6	1.5-2.5	.32	.32	3	6	48	
		8-22	18-35	1.40-1.55	0.6-2	0.17-0.19	0.4-5.8	0.5-1.0	.32	.32				
		22-24	35-60	1.35-1.45	0.0015-0.6	0.15-0.19	5.8-13.7	0.0-0.5	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
806D:														
Whalan-----	80	0-8	18-25	1.30-1.45	0.6-2	0.22-0.24	0.4-2.6	2.0-3.0	.32	.32	3	6	48	
		8-12	18-35	1.40-1.55	0.6-2	0.17-0.19	0.4-5.8	0.5-1.0	.32	.32				
		12-22	18-35	1.40-1.55	0.6-2	0.17-0.19	0.4-5.8	0.5-1.0	.32	.32				
		22-24	35-60	1.35-1.45	0.0015-0.6	0.15-0.19	5.8-13.7	0.0-0.5	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
813B: Atkinson-----	55	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
		0-7	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	3	6	48
		7-13	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-4.0	.24	.24			
		13-24	24-32	1.45-1.70	0.6-2	0.17-0.19	2.3-4.8	1.0-2.0	.32	.32			
		24-45	20-35	1.45-1.70	0.6-2	0.17-0.19	1.0-5.8	1.0-2.0	.32	.32			
		45-50	40-50	1.50-1.60	0.06-0.2	0.12-0.15	7.3-10.5	0.0-0.5	.32	.32			
		50-80	---	---	2-20	---	---	---	---	---			
814: Rockton-----	95	0-8	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28	3	6	48
		8-15	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28			
		15-26	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.5-1.0	.28	.28			
		26-31	35-60	1.35-1.45	0.6-2	0.10-0.14	5.8-13.7	0.0-0.5	.28	.28			
		31-80	---	---	2-20	---	---	---	---	---			
814B: Rockton-----	85	0-8	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28	3	6	48
		8-15	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28			
		15-26	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.5-1.0	.28	.28			
		26-31	35-60	1.35-1.45	0.6-2	0.10-0.14	5.8-13.7	0.0-0.5	.28	.28			
		31-80	---	---	2-20	---	---	---	---	---			
814C: Rockton-----	85	0-8	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28	3	6	48
		8-15	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28			
		15-26	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.5-1.0	.28	.28			
		26-31	35-60	1.35-1.45	0.6-2	0.10-0.14	5.8-13.7	0.0-0.5	.28	.28			
		31-80	---	---	2-20	---	---	---	---	---			
814D: Rockton-----	75	0-8	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28	3	6	48
		8-15	18-27	1.30-1.40	0.6-2	0.20-0.22	0.4-3.2	3.0-4.0	.28	.28			
		15-26	25-35	1.40-1.55	0.6-2	0.17-0.19	2.6-5.8	0.5-1.0	.28	.28			
		26-31	35-60	1.35-1.45	0.6-2	0.10-0.14	5.8-13.7	0.0-0.5	.28	.28			
		31-80	---	---	2-20	---	---	---	---	---			
837D2: Village, moderately eroded-----	75	0-8	18-25	1.25-1.40	0.6-2	0.21-0.23	0.4-2.6	1.5-2.5	.37	.37	4	5	56
		8-26	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.0-0.5	.43	.43			
		26-31	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.0-0.5	.43	.43			
		31-36	27-35	1.30-1.45	0.6-2	0.18-0.20	3.2-5.8	0.0-0.5	.43	.43			
		36-50	45-70	1.25-1.45	0.06-0.2	0.10-0.15	8.9-16.8	0.0-0.5	.28	.28			
		50-57	45-70	1.25-1.45	0.06-0.2	0.10-0.15	8.9-16.8	0.0-0.5	.28	.28			
		57-60	15-40	1.20-1.35	0.2-0.6	0.10-0.15	0.0-7.3	0.0-0.5	.20	.20			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
837E2: Village, moderately eroded-----	80	In	Pct	g/cc	In/hr	In/in	Pct	Pct						
		0-8	18-25	1.25-1.40	0.6-2	0.21-0.23	0.4-2.6	1.5-2.5	.37	.37	4	5	56	
		8-10	18-25	1.25-1.40	0.6-2	0.21-0.23	0.4-2.6	0.0-0.5	.37	.37				
		10-31	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.0-0.5	.43	.43				
		31-36	27-35	1.30-1.45	0.6-2	0.18-0.20	3.2-5.8	0.0-0.5	.43	.43				
		36-57	45-70	1.25-1.45	0.06-0.2	0.10-0.15	8.9-16.8	0.0-0.5	.28	.28				
		57-60	15-40	1.20-1.35	0.2-0.6	0.10-0.15	0.0-7.3	0.0-0.5	.20	.20				
838D: Allamakee-----	90	0-8	12-25	1.25-1.40	0.6-2	0.21-0.23	0.0-2.6	2.5-3.5	.32	.32	4	5	56	
		8-10	18-26	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43				
		10-16	20-30	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43				
		16-23	20-30	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.0-0.5	.43	.43				
		23-27	35-70	1.25-1.45	0.06-0.2	0.10-0.15	5.8-16.8	0.0-0.5	.28	.28				
		27-32	50-70	1.25-1.45	0.06-0.2	0.10-0.15	10.8-16.8	0.0-0.5	.20	.28				
		32-48	50-70	1.25-1.45	0.06-0.2	0.10-0.15	10.8-16.8	0.0-0.5	.20	.28				
		48-60	15-50	1.20-1.35	0.2-0.6	0.10-0.15	0.0-10.5	0.0-0.5	.20	.20				
838E: Allamakee-----	90	0-8	12-25	1.25-1.40	0.6-2	0.21-0.23	0.0-2.6	2.5-3.5	.32	.32	4	5	56	
		8-16	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43				
		16-23	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.0-0.5	.43	.43				
		23-27	35-70	1.25-1.45	0.06-0.2	0.10-0.15	5.8-16.8	0.0-0.5	.28	.28				
		27-48	50-70	1.25-1.45	0.06-0.2	0.10-0.15	10.5-16.8	0.0-0.5	.20	.28				
		48-60	15-50	1.20-1.35	0.2-0.6	0.10-0.15	0.0-10.5	0.0-0.5	.20	.20				
840E: Lacrescent-----	75	0-10	18-30	1.25-1.35	0.6-2	0.18-0.24	0.4-4.2	3.0-5.0	.28	.28	3	6	48	
		10-17	8-23	1.30-1.50	0.6-6	0.06-0.09	0.0-2.0	0.5-1.0	.32	.43				
		17-28	8-20	1.30-1.50	2-6	0.05-0.08	0.0-1.0	0.0-0.5	.32	.32				
		28-60	8-20	1.30-1.50	2-6	0.05-0.08	0.0-1.0	0.0-0.5	.32	.32				
840G: Lacrescent-----	75	0-10	18-30	1.25-1.35	0.6-2	0.18-0.24	0.4-4.2	3.0-5.0	.28	.28	3	6	48	
		10-17	8-23	1.30-1.50	0.6-6	0.06-0.09	0.0-2.0	0.5-1.0	.32	.43				
		17-28	8-20	1.30-1.50	2-6	0.05-0.08	0.0-1.0	0.0-0.5	.32	.32				
		28-60	8-20	1.30-1.50	2-6	0.05-0.08	0.0-1.0	0.0-0.5	.32	.32				
841G: Boone-----	65	0-3	2-6	1.55-1.65	6-20	0.10-0.13	0.0-0.0	0.5-1.5	.17	.17	3	2	134	
		3-8	0-3	1.55-1.70	6-20	0.04-0.11	0.0-0.0	0.0-0.5	.15	.15				
		8-21	0-3	1.55-1.70	6-20	0.04-0.11	0.0-0.0	0.0-0.5	.15	.15				
		21-35	0-3	1.55-1.70	6-20	0.04-0.11	0.0-0.0	0.0-0.5	.15	.15				
		35-60	---	---	0.2-2	---	---	0.0-0.5	---	---				
Rock outcrop-----	20	0-80	---	---	---	---	---	---	---	---	-	8	0	

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
861E: Yellowriver-----	95	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
		0-5	15-27	1.30-1.35	0.6-2	0.20-0.22	0.0-3.2	2.0-3.0	.37	.37	5	6	48
		5-12	12-27	1.30-1.45	0.6-2	0.18-0.20	0.0-5.8	0.5-1.0	.43	.43			
		12-18	20-27	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43			
		18-26	20-30	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43			
		26-48	20-32	1.45-1.50	0.6-2	0.18-0.20	1.6-2.9	0.0-0.5	.43	.43			
	48-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.6-2.9	0.0-0.5	.43	.43				
861F: Yellowriver-----	95	0-5	15-27	1.30-1.35	0.6-2	0.20-0.22	0.0-3.2	2.0-3.0	.37	.37	5	6	48
		5-12	12-35	1.30-1.45	0.6-2	0.18-0.20	0.0-5.8	0.5-1.0	.43	.43			
		12-26	20-35	1.30-1.45	0.6-2	0.18-0.20	1.0-5.8	0.5-1.0	.43	.43			
		26-48	22-26	1.45-1.50	0.6-2	0.18-0.20	1.6-2.9	0.0-0.5	.43	.43			
		48-60	22-26	1.45-1.50	0.6-2	0.18-0.20	1.6-2.9	0.0-0.5	.43	.43			
903C: Frankville-----		75	0-8	15-25	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	2.5-3.5	.37	.37	3	6
	8-14		18-27	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	0.5-2.0	.37	.37			
	14-18		23-32	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	0.5-2.0	.37	.37			
	18-23		23-32	1.30-1.45	0.6-2	0.18-0.20	2.0-4.8	0.0-0.5	.43	.43			
	23-28		40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.32	.32			
	28-80		---	---	2-20	---	---	---	---	---			
903D2: Frankville, moderately eroded-----	75		0-8	15-25	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	2.0-3.0	.37	.37	3	6
		8-18	15-25	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	0.5-1.5	.37	.37			
		18-23	23-32	1.30-1.45	0.6-2	0.18-0.20	2.0-4.8	0.0-0.5	.43	.43			
		23-28	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.32	.32			
		28-80	---	---	2-20	---	---	---	---	---			
903E2: Frankville, moderately eroded-----	75	0-8	15-25	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	2.0-3.0	.37	.37	3	6	48
		8-18	15-25	1.30-1.35	0.6-2	0.21-0.23	0.0-2.6	0.5-1.5	.37	.37			
		18-23	23-32	1.30-1.45	0.6-2	0.18-0.20	2.0-4.8	0.0-0.5	.43	.43			
		23-28	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.32	.32			
		28-80	---	---	2-20	---	---	---	---	---			
912F: Paintcreek-----	95	0-4	12-25	1.25-1.40	0.6-2	0.21-0.23	0.0-2.6	2.0-3.0	.37	.37	3	5	56
		4-8	12-25	1.25-1.40	0.6-2	0.21-0.23	0.0-2.6	0.5-1.0	.37	.37			
		8-11	18-25	1.30-1.45	0.6-2	0.18-0.20	1.0-4.2	0.5-1.0	.43	.43			
		11-15	20-30	1.30-1.45	0.6-2	0.18-0.20	1.0-4.2	0.2-0.8	.43	.43			
		15-35	35-70	1.25-1.45	0.06-0.2	0.10-0.15	5.8-16.8	0.0-0.5	.28	.28			
		35-43	50-70	1.25-1.45	0.06-0.2	0.10-0.15	10.5-16.8	0.0-0.5	.20	.28			
		43-60	50-70	1.25-1.45	0.06-0.2	0.10-0.15	10.5-16.8	0.0-0.5	.20	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
914B:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Winneshiek-----	85	0-8	18-27	1.45-1.50	0.6-2	0.19-0.21	0.4-3.2	2.5-3.5	.24	.24	3	6	48	
		8-11	20-27	1.50-1.70	0.6-2	0.17-0.19	1.0-3.2	0.0-1.0	.28	.28				
		11-16	20-27	1.50-1.70	0.6-2	0.17-0.19	1.0-3.2	0.0-1.0	.28	.28				
		16-21	20-35	1.50-1.70	0.6-2	0.17-0.19	1.0-5.8	0.0-1.0	.28	.28				
		21-24	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-1.0	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
914C:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Winneshiek-----	75	0-8	18-27	1.45-1.50	0.6-2	0.19-0.21	0.4-3.2	2.5-3.5	.24	.24	3	6	48	
		8-16	20-27	1.50-1.70	0.6-2	0.17-0.19	1.0-3.2	0.0-1.0	.28	.28				
		16-21	20-35	1.50-1.70	0.6-2	0.17-0.19	1.0-5.8	0.0-1.0	.28	.28				
		21-24	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-1.0	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
914D:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Winneshiek-----	80	0-8	18-27	1.45-1.50	0.6-2	0.19-0.21	0.4-3.2	2.5-3.5	.24	.24	3	6	48	
		8-16	20-27	1.50-1.70	0.6-2	0.17-0.19	1.0-3.2	0.0-1.0	.28	.28				
		16-21	20-35	1.50-1.70	0.6-2	0.17-0.19	1.0-5.8	0.0-1.0	.28	.28				
		21-24	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-1.0	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
914E:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Winneshiek-----	80	0-8	18-27	1.45-1.50	0.6-2	0.19-0.21	0.4-3.2	2.5-3.5	.24	.24	3	6	48	
		8-16	20-27	1.50-1.70	0.6-2	0.17-0.19	1.0-3.2	0.0-1.0	.28	.28				
		16-21	20-35	1.50-1.70	0.6-2	0.17-0.19	1.0-5.8	0.0-1.0	.28	.28				
		21-24	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-1.0	.32	.32				
		24-80	---	---	2-20	---	---	---	---	---				
926:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Canoe, rarely flooded	95	0-8	18-24	1.30-1.35	0.6-2	0.22-0.24	0.4-2.3	2.5-3.5	.28	.28	5	6	48	
		8-23	18-27	1.35-1.40	0.6-2	0.20-0.22	1.0-3.2	1.0-2.0	.43	.43				
		23-30	18-27	1.35-1.40	0.6-2	0.20-0.22	1.0-3.2	1.0-2.0	.43	.43				
		30-49	18-28	1.40-1.45	0.6-2	0.20-0.22	0.4-4.2	0.0-1.0	.43	.43				
		49-60	15-25	1.40-1.45	0.6-2	0.20-0.22	0.4-4.2	0.0-1.0	.43	.43				
		60-72	15-25	1.40-1.45	0.6-2	0.20-0.22	0.4-4.2	0.0-1.0	.43	.43				
965C2:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Dubuque, moderately eroded-----	55	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.37	.37	3	6	48	
		8-22	26-35	1.30-1.45	0.6-2	0.18-0.20	2.9-5.8	0.0-1.0	.37	.37				
		22-27	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.37	.37				
		27-80	---	---	2-20	---	---	---	---	---				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth In	Clay Pct	Moist bulk density g/cc	Permea- bility In/hr	Available water capacity In/in	Linear extensi- bility Pct	Organic matter Pct	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
965C2: Fayette, moderately eroded-----	40	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
965D2: Dubuque, moderately eroded-----	50	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.37	.37	3	6	48
		8-16	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.5	.37	.37			
		16-22	26-35	1.30-1.45	0.6-2	0.18-0.20	2.9-5.8	0.0-1.0	.37	.37			
		22-27	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.37	.37			
		27-80	---	---	2-20	---	---	---	---	---			
Fayette, moderately eroded-----	30	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
965E2: Dubuque, moderately eroded-----	50	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.37	.37	3	6	48
		8-16	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.5	.37	.37			
		16-22	26-35	1.30-1.45	0.6-2	0.18-0.20	2.9-5.8	0.0-1.0	.37	.37			
		22-27	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.37	.37			
		27-80	---	---	2-20	---	---	---	---	---			
Fayette, moderately eroded-----	30	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
965G: Dubuque-----	55	0-3	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.37	.37	3	6	48
		3-11	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.5	.37	.37			
		11-16	18-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.5	.37	.37			
		16-22	26-35	1.30-1.45	0.6-2	0.18-0.20	2.9-5.8	0.0-1.0	.37	.37			
		22-27	40-55	1.50-1.60	0.06-0.2	0.12-0.15	7.3-12.1	0.0-0.5	.37	.37			
		27-80	---	---	2-20	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
965G:		In	Pct	g/cc	In/hr	In/in	Pct	Pct						
Fayette-----	40	0-3	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	6	48	
		3-11	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.32	.32				
		11-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43				
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43				
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43				
978:														
Festina-----	100	0-8	18-24	1.30-1.35	0.6-2	0.22-0.24	0.4-2.3	3.0-4.0	.28	.28	5	6	48	
		8-11	24-29	1.35-1.40	0.6-2	0.20-0.22	2.3-3.9	0.0-1.0	.43	.43				
		11-20	22-26	1.40-1.45	0.6-2	0.20-0.22	1.6-2.9	0.0-0.5	.43	.43				
		20-32	22-26	1.40-1.45	0.6-2	0.20-0.22	1.6-2.9	0.0-0.5	.43	.43				
		32-65	22-26	1.40-1.45	0.6-2	0.20-0.22	1.6-2.9	0.0-0.5	.43	.43				
		65-80	8-18	1.45-1.55	2-6	0.10-0.18	0.0-0.4	0.0-0.5	.43	.43				
978B:														
Festina-----	100	0-8	18-24	1.30-1.35	0.6-2	0.22-0.24	0.4-2.3	2.5-3.5	.28	.28	5	6	48	
		8-11	24-29	1.35-1.40	0.6-2	0.20-0.22	2.3-3.9	0.0-1.0	.43	.43				
		11-65	22-26	1.40-1.45	0.6-2	0.20-0.22	1.6-2.9	0.0-0.5	.43	.43				
		65-80	8-18	1.45-1.55	2-6	0.10-0.18	0.0-0.4	0.0-0.5	.43	.43				
1026:														
Bearpen, rarely flooded-----	80	0-8	10-25	1.30-1.50	0.6-2	0.22-0.24	0.0-2.6	1.0-4.0	.32	.32	5	5	56	
		8-18	10-25	1.30-1.50	0.6-2	0.22-0.24	0.0-2.6	1.0-4.0	.32	.32				
		18-41	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.43	.43				
		41-50	10-30	1.55-1.70	0.6-2	0.11-0.18	0.0-4.2	0.0-0.5	.43	.43				
		50-60	10-30	1.55-1.70	0.6-2	0.11-0.18	0.0-4.2	0.0-0.5	.43	.43				
1084:														
Bearpen, rarely flooded, overwash----	50	0-8	10-25	1.30-1.50	0.6-2	0.22-0.24	0.0-2.6	1.0-4.0	.32	.32	5	5	56	
		8-18	10-25	1.30-1.50	0.6-2	0.22-0.24	0.0-2.6	1.0-4.0	.32	.32				
		18-41	18-30	1.40-1.55	0.6-2	0.18-0.22	0.4-4.2	0.0-1.0	.43	.43				
		41-50	10-30	1.55-1.70	0.6-2	0.11-0.18	0.0-4.2	0.0-0.5	.43	.43				
		50-60	10-30	1.55-1.70	0.6-2	0.11-0.18	0.0-4.2	0.0-0.5	.43	.43				
Lawson, rarely flooded, overwash----	40	0-8	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28	5	5	56	
		8-30	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28				
		30-40	10-30	1.20-1.55	0.6-2	0.18-0.22	0.0-4.2	3.0-7.0	.28	.28				
		40-60	18-30	1.55-1.65	0.6-2	0.18-0.20	0.4-4.2	1.0-4.0	.43	.43				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth In	Clay Pct	Moist bulk density g/cc	Permea- bility In/hr	Available water capacity In/in	Linear extensi- bility Pct	Organic matter Pct	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
1152: Marshan, rarely flooded-----	75	0-8	25-35	1.30-1.40	0.1-1	0.20-0.22	2.6-5.8	5.0-6.0	.28	.28	4	6	48
		8-14	25-35	1.30-1.40	0.1-1	0.20-0.22	2.6-5.8	2.0-5.0	.28	.28			
		14-18	25-35	1.40-1.55	0.1-1	0.17-0.22	2.6-5.8	1.0-3.0	.28	.28			
		18-23	25-35	1.40-1.55	0.1-1	0.17-0.22	2.6-5.8	0.5-1.0	.28	.28			
		23-30	18-30	1.45-1.55	0.1-1	0.15-0.19	0.4-4.2	0.5-1.0	.28	.28			
		30-40	0-5	1.55-1.65	1-101	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			
		40-60	0-5	1.55-1.65	1-101	0.02-0.05	0.0-0.0	0.0-0.5	.15	.15			
1489B: Lawson, frequently flooded-----	55	0-8	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28	5	5	56
		8-30	10-27	1.20-1.55	0.6-2	0.22-0.24	0.0-3.2	4.0-6.0	.28	.28			
		30-40	10-30	1.20-1.55	0.6-2	0.18-0.22	0.0-4.2	3.0-7.0	.28	.28			
		40-60	18-30	1.55-1.65	0.6-2	0.18-0.20	0.4-4.2	1.0-4.0	.43	.43			
Ossian, frequently flooded-----	40	0-8	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	5.0-7.0	.28	.28	5	6	48
		8-15	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	5.0-7.0	.28	.28			
		15-23	22-27	1.25-1.30	0.6-2	0.22-0.24	1.6-3.2	3.0-6.0	.28	.28			
		23-66	20-30	1.30-1.40	0.6-2	0.20-0.22	1.0-4.2	1.0-4.0	.28	.28			
		66-80	20-30	1.30-1.40	0.6-2	0.20-0.22	1.0-4.2	1.0-4.0	.28	.28			
1763E2: Fayette, moderately eroded-----	50	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
Exette, moderately eroded-----	45	0-8	18-26	1.30-1.35	0.6-2	0.21-0.23	0.4-2.9	1.5-2.5	.37	.37	5	6	48
		8-11	18-26	1.30-1.35	0.6-2	0.21-0.23	0.4-2.9	0.5-2.0	.37	.37			
		11-33	18-27	1.35-1.45	0.6-2	0.20-0.22	0.4-3.2	0.0-0.5	.43	.43			
		33-60	15-20	1.45-1.50	0.6-2	0.20-0.22	0.0-1.0	0.0-0.5	.43	.43			
1763F2: Fayette, moderately eroded-----	50	0-8	15-26	1.30-1.35	0.6-2	0.20-0.22	0.0-2.9	1.5-2.5	.32	.32	5	6	48
		8-26	24-32	1.30-1.45	0.6-2	0.18-0.20	2.3-4.8	0.0-1.0	.43	.43			
		26-47	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			
		47-60	20-30	1.45-1.50	0.6-2	0.18-0.20	1.0-4.2	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind	Wind	
									Kw	Kf	T	erodi- bility group	erodi- bility index	
1763F2: Exette, moderately eroded-----	45	In	Pct	g/cc	In/hr	In/in	Pct	Pct						
		0-8	18-26	1.30-1.35	0.6-2	0.21-0.23	0.4-2.9	1.5-2.5	.37	.37	5	6	48	
		8-11	18-26	1.30-1.35	0.6-2	0.21-0.23	0.4-2.9	0.5-2.0	.37	.37				
		11-33	18-27	1.35-1.45	0.6-2	0.20-0.22	0.4-3.2	0.0-0.5	.43	.43				
		33-60	15-20	1.45-1.50	0.6-2	0.20-0.22	0.0-1.0	0.0-0.5	.43	.43				
1936: Udifluvents, channeled, frequently flooded-----	50	0-7	5-18	1.50-1.60	2-6	0.15-0.18	0.0-0.4	1.0-2.0	.20	.20	5	3	86	
		7-44	5-18	1.50-1.60	2-6	0.13-0.18	0.0-0.4	0.0-0.5	.20	.20				
		44-80	3-15	1.50-1.60	2-20	0.02-0.15	0.0-0.0	0.0-0.5	.17	.17				
Spillville, channeled, frequently flooded---	35	0-20	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48	
		20-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24				
		54-80	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	2.0-3.0	.28	.28				
2486: Spillville, occasionally flooded	50	0-8	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24	5	6	48	
		8-20	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	4.0-5.0	.24	.24				
		20-54	18-26	1.45-1.55	0.6-2	0.19-0.21	0.4-2.9	3.0-5.0	.24	.24				
		54-80	14-24	1.55-1.70	0.6-6	0.15-0.18	0.0-2.3	2.0-3.0	.28	.28				
Waukee-----	35	0-8	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	3.0-4.0	.24	.24	4	6	48	
		8-16	18-24	1.40-1.45	0.6-2	0.20-0.22	0.4-2.3	2.0-3.0	.24	.24				
		16-20	18-27	1.40-1.45	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28				
		20-35	18-27	1.40-1.50	0.6-2	0.15-0.19	0.4-3.2	0.5-2.0	.28	.28				
		35-44	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17				
		44-66	2-8	1.50-1.75	20-101	0.02-0.06	0.0-0.0	0.0-0.5	.10	.17				
2551: Calamine-----	50	0-8	26-35	1.20-1.35	0.6-2	0.17-0.24	0.4-3.2	5.0-6.0	.28	.28	4	6	48	
		8-20	26-35	1.20-1.35	0.6-2	0.17-0.24	0.4-3.2	5.0-6.0	.28	.28				
		20-27	27-35	1.50-1.60	0.2-0.6	0.18-0.22	3.2-5.8	0.5-1.5	.43	.43				
		27-34	35-50	1.55-1.65	0.0015-0.06	0.08-0.12	7.3-10.5	0.0-0.5	.32	.32				
		34-46	40-50	1.60-1.70	0.0015-0.06	0.08-0.12	7.3-10.5	0.0-0.5	.32	.32				
		46-60	---	---	0.0015-0.06	---	---	0.0-0.5	---	---				
Jacwin-----	35	0-8	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	5.0-6.0	.28	.28	4	7	38	
		8-13	24-32	1.35-1.45	0.6-2	0.20-0.22	2.3-4.8	5.0-6.0	.28	.28				
		13-24	20-32	1.50-1.60	0.6-2	0.17-0.19	1.0-4.8	1.0-2.0	.28	.28				
		24-37	45-60	1.50-1.60	0.0015-0.06	0.12-0.14	8.9-13.7	0.0-1.0	.28	.28				
		37-80	---	---	0.0015-0.06	---	---	0.0-1.0	---	---				

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
									Kw	Kf	T		
2671: Ion, occasionally flooded-----	65	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
		0-8	10-18	1.25-1.35	0.6-2	0.21-0.23	0.0-0.4	2.0-4.0	.32	.32	5	4L	86
		8-36	10-18	1.25-1.35	0.6-2	0.21-0.23	0.0-0.4	2.0-4.0	.32	.32			
		36-60	12-22	1.35-1.40	0.6-2	0.19-0.21	0.0-1.6	3.0-4.0	.32	.32			
Eitzen, occasionally flooded-----	35	0-8	18-25	1.35-1.45	0.6-2	0.22-0.24	0.4-2.6	2.0-4.0	.28	.28	5	6	48
		8-25	18-25	1.35-1.45	0.6-2	0.22-0.24	0.4-2.6	1.0-2.0	.28	.28			
		25-48	18-27	1.30-1.45	0.6-2	0.20-0.22	0.4-3.2	2.0-4.0	.28	.28			
		48-66	18-27	1.40-1.65	0.6-2	0.18-0.20	0.4-3.2	1.0-2.0	.28	.28			
		66-72	18-27	1.40-1.65	0.6-2	0.18-0.20	0.4-3.2	1.0-2.0	.28	.28			
5010. Pits, sand and gravel													
5030. Pits, limestone quarries													
5040. Udorthents													
5080: Udorthents-----	100	0-80	12-32	1.45-1.65	0.0-0.0	0.12-0.18	3.0-5.9	---	.32	---	-	---	---
AW. Animal waste lagoon													
SL. Sewage lagoon													
W. Water													

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 extractable bases 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.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

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	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
		In meq/100 g	meq/100 g	pH	Pct
27B:					
Terril-----	0-8	16-22	---	6.1-7.3	0
	8-36	13-25	---	6.1-7.8	0-15
	36-60	11-24	---	6.1-7.8	0-15
41:					
Sparta-----	0-8	3.6-10	---	5.1-7.3	0
	8-15	3.3-9.2	---	5.1-7.3	0
	15-72	0.8-5.8	---	5.1-6.5	0
	72-80	0.0-3.8	---	5.1-6.0	0
41B:					
Sparta-----	0-8	3.6-10	---	5.1-7.3	0
	8-15	3.3-9.2	---	5.1-7.3	0
	15-72	0.8-5.8	---	5.1-6.5	0
	72-80	0.0-3.8	---	5.1-6.0	0
41D:					
Sparta-----	0-8	3.6-10	---	5.1-7.3	0
	8-15	3.3-9.2	---	5.1-7.3	0
	15-72	0.8-5.8	---	5.1-6.5	0
	72-80	0.0-3.8	---	5.1-6.0	0
63B:					
Chelsea-----	0-8	6.1-11	---	5.6-7.3	0
	8-36	3.1-7.4	---	5.1-6.5	0
	36-70	3.1-7.4	---	5.1-6.5	0
63D:					
Chelsea-----	0-8	6.1-11	---	5.6-7.3	0
	8-32	3.1-7.4	---	5.1-6.5	0
	32-70	3.1-7.4	---	5.1-6.5	0
84:					
Clyde-----	0-8	18-28	---	6.6-7.3	0
	8-17	23-27	---	6.6-7.3	0
	17-23	22-27	---	6.6-7.3	0
	23-28	18-25	---	6.1-7.3	0
	28-41	18-25	---	6.1-7.3	0
	41-44	8.6-13	---	6.1-7.3	0
	44-62	14-22	---	6.6-8.4	0-25
	62-66	14-22	---	6.6-8.4	0-25
85:					
Eitzen, occasionally flooded-----	0-8	16-21	---	5.6-7.3	0
	8-25	15-21	---	5.6-7.3	0
	25-48	16-23	---	5.1-6.5	0
	48-55	15-22	---	5.1-6.0	0
	55-60	15-22	---	5.1-6.0	0
98:					
Huntsville, occasionally flooded	0-8	16-23	---	6.1-7.3	0
	8-27	16-23	---	6.1-7.3	0
	27-52	14-21	---	5.6-7.8	0
	52-60	14-21	---	5.6-7.8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
98B: Huntsville, occasionally flooded	0-8	16-23	---	6.1-7.3	0
	8-27	16-23	---	6.1-7.3	0
	27-52	14-21	---	5.6-7.8	0
	52-60	14-21	---	5.6-7.8	0
109B: Backbone-----	0-8	7.3-16	---	5.6-7.3	0
	8-17	7.3-16	---	5.1-7.3	0
	17-24	10-15	---	5.1-7.3	0
	24-30	14-30	---	5.1-6.0	0
	30-80	---	---	---	---
109C: Backbone-----	0-8	7.3-16	---	5.6-7.3	0
	8-24	10-15	---	5.1-7.3	0
	24-30	14-30	---	5.1-6.0	0
	30-80	---	---	---	---
109D: Backbone-----	0-8	7.3-16	---	5.6-7.3	0
	8-24	10-15	---	5.1-7.3	0
	24-30	14-30	---	5.1-6.0	0
	30-80	---	---	---	---
135: Coland, occasionally flooded-----	0-8	23-30	---	6.1-7.3	0
	8-32	23-29	---	6.1-7.3	0
	32-40	21-29	---	6.1-7.3	0
	40-44	8.9-23	---	6.1-7.8	0-20
	44-52	8.9-23	---	6.1-7.8	0-20
	52-66	8.9-22	---	6.1-7.8	0-20
136B: Ankeny-----	0-8	10.0-17	---	6.1-7.3	0
	8-38	10.0-17	---	6.1-7.3	0
	38-44	8.5-13	---	6.1-7.3	0
	44-60	1.6-7.2	---	6.1-7.3	0
162B: Downs-----	0-8	13-22	---	5.1-7.3	0
	8-12	12-21	---	5.1-7.3	0
	12-17	12-21	---	5.1-7.3	0
	17-33	19-25	---	4.5-7.3	0
	33-39	14-23	---	5.6-7.3	0-15
	39-48	14-23	---	5.6-7.3	0-15
	48-60	14-23	---	5.6-7.3	0-15
162C: Downs-----	0-8	13-22	---	5.1-7.3	0
	8-12	12-21	---	5.1-7.3	0
	12-17	12-21	---	5.1-7.3	0
	17-33	19-25	---	4.5-7.3	0
	33-48	14-23	---	5.6-7.3	0-15
	48-60	14-23	---	5.6-7.3	0-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
162D:					
Downs-----	0-8	13-22	---	5.1-7.3	0
	8-12	12-21	---	5.1-7.3	0
	12-17	12-21	---	5.1-7.3	0
	17-33	19-25	---	4.5-7.3	0
	33-48	14-23	---	5.6-7.3	0-15
	48-60	14-23	---	5.6-7.3	0-15
162E2:					
Downs, moderately eroded-----	0-7	13-22	---	5.1-7.3	0
	7-10	19-25	---	4.5-7.3	0
	10-26	19-25	---	4.5-7.3	0
	26-37	19-25	---	4.5-7.3	0
	37-42	14-23	---	5.6-7.3	0-15
	42-60	14-23	---	5.6-7.3	0-15
163B:					
Fayette-----	0-8	13-22	---	5.1-7.3	0
	8-11	11-21	---	5.1-7.3	0
	11-14	11-21	---	5.1-7.3	0
	14-26	17-25	---	4.5-6.5	0
	26-34	17-25	---	4.5-6.5	0
	34-47	14-23	---	5.1-7.8	0-15
	47-73	14-23	---	5.1-7.8	0-15
163C2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
163D2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
163E2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
163F:					
Fayette-----	0-3	13-22	---	5.1-7.3	0
	3-11	11-21	---	5.1-7.3	0
	11-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
163G:					
Fayette-----	0-3	13-22	---	5.1-7.3	0
	3-11	11-21	---	5.1-7.3	0
	11-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
175B:					
Dickinson-----	0-8	11-16	---	5.6-7.3	0
	8-18	8.6-16	---	5.1-6.5	0
	18-30	7.6-15	---	5.1-6.5	0
	30-36	4.1-8.6	---	5.1-6.5	0
	36-60	4.1-8.6	---	5.6-6.5	0
177C2:					
Saude, moderately eroded-----	0-8	16-21	---	5.6-7.3	0
	8-24	10-15	---	5.1-6.0	0
	24-28	10-15	---	5.1-6.0	0
	28-36	1.8-7.1	---	5.1-6.5	0
	36-60	1.8-7.1	---	5.1-6.5	0
178:					
Waukee-----	0-8	16-21	---	5.6-6.5	0
	8-16	16-20	---	5.6-6.5	0
	16-20	15-22	---	5.1-6.0	0
	20-35	15-22	---	5.1-6.0	0
	35-44	1.8-7.1	---	5.6-6.5	0
	44-66	1.8-7.1	---	5.6-6.5	0
178B:					
Waukee-----	0-8	16-21	---	5.6-6.5	0
	8-16	16-20	---	5.6-6.5	0
	16-20	15-22	---	5.1-6.0	0
	20-35	15-22	---	5.1-6.0	0
	35-44	1.8-7.1	---	5.6-6.5	0
	44-66	1.8-7.1	---	5.6-6.5	0
196:					
Volney, occasionally flooded-----	0-30	16-21	---	7.6-8.4	15-30
	30-80	8.9-20	---	7.9-8.4	15-30
196+:					
Volney, occasionally flooded, overwash---	0-8	7.6-16	---	5.6-7.8	0-20
	8-30	16-21	---	7.6-8.4	15-30
	30-80	8.9-20	---	7.9-8.4	15-30
196B:					
Volney, rarely flooded-----	0-30	16-21	---	7.6-8.4	15-30
	30-80	8.9-20	---	7.9-8.4	15-30
198B:					
Floyd-----	0-8	18-24	---	6.1-7.3	0
	8-24	17-24	---	6.1-7.3	0
	24-33	15-20	---	6.1-7.3	0
	33-41	5.5-20	---	6.6-7.3	0
	41-50	13-24	---	6.6-8.4	0-25
	50-60	13-23	---	6.6-8.4	0-25
221:					
Klossner-----	0-10	65-65	---	5.1-7.4	0
	10-26	65-65	---	5.1-7.4	0
	26-48	2.0-15	---	6.1-8.4	0-30
	48-80	2.0-15	---	6.1-8.4	0-30

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
221+:					
Klossner, occasionally flooded, overwash---	0-10	65-65	---	5.1-7.4	0
	10-26	65-65	---	5.1-7.4	0
	26-48	2.0-15	---	6.1-8.4	0-30
	48-80	2.0-15	---	6.1-8.4	0-30
235:					
Turlin, rarely flooded-----	0-9	16-22	---	6.1-7.3	0
	9-34	16-22	---	6.1-7.3	0
	34-41	17-23	---	5.6-7.3	0
	41-68	17-24	---	5.6-7.3	0
	68-80	6.2-15	---	6.1-7.3	0
Coland, occasionally flooded-----	0-8	23-30	---	6.1-7.3	0
	8-32	23-29	---	6.1-7.3	0
	32-40	21-29	---	6.1-7.3	0
	40-44	8.9-23	---	6.1-7.8	0-20
	44-52	8.9-23	---	6.1-7.8	0-20
	52-60	8.9-22	---	6.1-7.8	0-20
241B:					
Lilah-----	0-8	4.2-10	---	5.1-6.0	0
	8-15	---	3.0-6.7	5.1-6.0	0
	15-28	---	0.2-4.2	5.1-6.0	0
	28-39	---	0.2-4.2	5.1-6.0	0
	39-60	---	0.2-2.8	5.1-6.0	0
Dickinson-----	0-8	11-16	---	5.6-7.3	0
	8-18	8.6-16	---	5.1-6.5	0
	18-30	7.6-15	---	5.1-6.5	0
	30-36	4.1-8.6	---	5.1-6.5	0
	36-60	4.1-8.6	---	5.6-6.5	0
241C:					
Lilah-----	0-8	4.2-10	---	5.1-6.0	0
	8-15	---	3.0-6.7	5.1-6.0	0
	15-28	---	0.2-4.2	5.1-6.0	0
	28-39	---	0.2-4.2	5.1-6.0	0
	39-60	---	0.2-2.8	5.1-6.0	0
Dickinson-----	0-8	11-16	---	5.6-7.3	0
	8-18	8.6-16	---	5.1-6.5	0
	18-30	7.6-15	---	5.1-6.5	0
	30-36	4.1-8.6	---	5.1-6.5	0
	36-60	4.1-8.6	---	5.6-6.5	0
241D:					
Lilah-----	0-8	4.2-10	---	5.1-6.0	0
	8-15	---	3.0-6.7	5.1-6.0	0
	15-28	---	0.2-4.2	5.1-6.0	0
	28-39	---	0.2-4.2	5.1-6.0	0
	39-60	---	0.2-2.8	5.1-6.0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-	Effective	Soil	Calcium
		exchange	cation-		
	In	capacity	exchange	pH	ate
		meq/100 g	capacity		Pct
241D:					
Dickinson-----	0-8	11-16	---	5.6-7.3	0
	8-18	8.6-16	---	5.1-6.5	0
	18-30	7.6-15	---	5.1-6.5	0
	30-36	4.1-8.6	---	5.1-6.5	0
	36-60	4.1-8.6	---	5.6-6.5	0
285B:					
Burkhardt-----	0-8	5.6-13	---	5.1-7.3	0
	8-17	5.6-13	---	5.1-7.3	0
	17-19	0.8-4.5	---	5.6-6.5	0
	19-29	0.8-4.5	---	5.6-6.5	0
	29-60	0.8-4.5	---	5.6-6.5	0
285F:					
Burkhardt-----	0-10	5.6-13	---	5.1-7.3	0
	10-17	5.6-13	---	5.1-7.3	0
	17-19	0.8-4.5	---	5.6-6.5	0
	19-29	0.8-4.5	---	5.6-6.5	0
	29-60	0.8-4.5	---	5.6-6.5	0
291B:					
Atterberry-----	0-8	13-22	---	5.6-7.3	0
	8-17	12-21	---	5.1-7.3	0
	17-24	18-25	---	5.1-7.3	0
	24-48	18-25	---	5.1-7.3	0
	48-60	15-23	---	5.6-7.8	0-15
302B:					
Coggon-----	0-3	16-20	---	5.1-7.3	0
	3-11	13-20	---	5.1-7.3	0
	11-17	---	11-15	4.5-6.0	0
	17-31	13-27	---	5.1-7.8	0
	31-44	13-27	---	5.1-7.8	0
	44-62	13-27	---	5.1-7.8	0
	62-80	13-27	---	5.1-7.8	0-25
302C:					
Coggon-----	0-3	16-20	---	5.1-7.3	0
	3-11	13-20	---	5.1-7.3	0
	11-17	---	11-15	4.5-6.0	0
	17-24	13-27	---	5.1-7.8	0
	24-60	13-27	---	5.1-7.8	0-25
302C2:					
Coggon, moderately eroded-----	0-8	15-20	---	5.1-7.3	0
	8-11	---	11-15	4.5-6.0	0
	11-24	13-27	---	5.1-7.8	0
	24-60	13-27	---	5.1-7.8	0-25
320:					
Arenzville, occasionally flooded	0-10	9.0-16	---	5.6-7.8	0
	10-25	8.6-15	---	5.6-7.8	0
	25-40	8.9-25	---	5.6-7.8	0
	40-60	8.9-16	---	5.6-7.8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
391B:					
Clyde-----	0-8	18-28	---	6.6-7.3	0
	8-17	23-27	---	6.6-7.3	0
	17-23	22-27	---	6.6-7.3	0
	23-41	18-25	---	6.1-7.3	0
	41-44	8.6-13	---	6.1-7.3	0
	44-62	14-22	---	6.6-8.4	0-25
	62-66	14-22	---	6.6-8.4	0-25
Floyd-----	0-8	18-24	---	6.1-7.3	0
	8-24	17-24	---	6.1-7.3	0
	24-33	15-20	---	6.1-7.3	0
	33-41	5.5-20	---	6.6-7.3	0
	41-50	13-24	---	6.6-8.4	0-25
	50-60	13-23	---	6.6-8.4	0-25
394B:					
Ostrander-----	0-8	16-23	---	5.6-7.3	0
	8-16	16-23	---	5.6-7.3	0
	16-24	15-22	---	5.1-7.3	0-5
	24-30	9.6-22	---	5.1-7.3	0-5
	30-50	9.6-22	---	5.1-7.3	0-5
	50-60	13-23	---	6.6-7.8	0-15
394C:					
Ostrander-----	0-8	16-23	---	5.6-7.3	0
	8-16	16-23	---	5.6-7.3	0
	16-24	15-22	---	5.1-7.3	0-5
	24-50	9.6-22	---	5.1-7.3	0-5
	50-60	13-23	---	6.6-7.8	0-15
395B:					
Marquis-----	0-8	16-22	---	5.6-7.3	0
	8-19	16-22	---	5.6-7.3	0
	19-24	17-25	---	5.1-7.3	0
	24-54	14-24	---	6.6-8.4	0-25
	54-80	14-23	---	6.6-8.4	0-25
444:					
Jacwin-----	0-8	18-27	---	6.1-7.3	0
	8-13	21-27	---	6.1-7.3	0
	13-24	17-26	---	6.1-7.3	0
	24-37	29-45	---	7.4-8.4	5-30
	37-80	---	---	---	---
444B:					
Jacwin-----	0-8	18-27	---	6.1-7.3	0
	8-13	21-27	---	6.1-7.3	0
	13-24	17-26	---	6.1-7.3	0
	24-37	29-45	---	7.4-8.4	5-30
	37-80	---	---	---	---
444C:					
Jacwin-----	0-8	18-27	---	6.1-7.3	0
	8-13	21-27	---	6.1-7.3	0
	13-24	17-26	---	6.1-7.3	0
	24-37	29-45	---	7.4-8.4	5-30
	37-80	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
468B:					
Dunkerton-----	0-8	4.6-15	---	5.6-7.3	0
	8-15	4.6-15	---	5.6-7.3	0
	15-25	7.6-18	---	5.1-7.3	0
	25-36	14-23	---	6.1-8.4	0-25
	36-49	14-23	---	6.1-8.4	0-25
	49-80	14-23	---	6.1-8.4	0-25
471:					
Oran-----	0-8	14-21	---	5.1-7.3	0
	8-13	12-20	---	5.1-7.3	0
	13-18	12-20	---	5.1-7.3	0
	18-45	15-24	---	4.5-6.5	0
	45-80	15-23	---	7.4-7.8	5-20
471B:					
Oran-----	0-8	14-21	---	5.1-7.3	0
	8-13	12-20	---	5.1-7.3	0
	13-18	12-20	---	5.1-7.3	0
	18-45	15-24	---	4.5-6.5	0
	45-80	15-23	---	7.4-7.8	5-20
480B:					
Orwood-----	0-8	13-21	---	5.6-7.3	0
	8-10	15-20	---	5.6-7.3	0
	10-22	15-20	---	5.6-7.3	0
	22-55	18-22	---	5.1-7.3	0
	55-80	13-20	---	5.6-7.3	0-20
480C2:					
Orwood, moderately eroded-----	0-8	13-20	---	5.6-7.3	0
	8-22	15-20	---	5.6-7.3	0
	22-50	18-22	---	5.1-7.3	0
	50-80	13-20	---	5.6-7.3	0-20
480D2:					
Orwood, moderately eroded-----	0-8	13-20	---	5.6-7.3	0
	8-22	15-20	---	5.6-7.3	0
	22-50	18-22	---	5.1-7.3	0
	50-80	13-20	---	5.6-7.3	0-20
480E2:					
Orwood, moderately eroded-----	0-8	13-20	---	5.6-7.3	0
	8-22	15-20	---	5.6-7.3	0
	22-50	18-22	---	5.1-7.3	0
	50-80	13-20	---	5.6-7.3	0-20
480E3:					
Orwood, severely eroded-----	0-8	13-20	---	5.6-7.3	0
	8-45	18-22	---	5.1-7.3	0
	45-80	13-20	---	5.6-7.3	0-20
480F2:					
Orwood, moderately eroded-----	0-8	13-20	---	5.6-7.3	0
	8-22	15-20	---	5.6-7.3	0
	22-50	18-22	---	5.1-7.3	0
	50-80	13-20	---	5.6-7.3	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-	Effective	Soil	Calcium
		exchange	cation-		
	In	capacity	exchange	pH	ate
		meq/100 g	capacity		Pct
			meq/100 g		
482B:					
Racine-----	0-8	16-23	---	5.1-7.3	0
	8-12	15-23	---	5.1-7.3	0
	12-28	18-26	---	4.5-6.0	0
	28-46	14-25	---	4.5-6.0	0
	46-65	13-23	---	6.6-7.8	0-25
484:					
Lawson, occasionally					
flooded-----	0-8	9.4-23	---	6.1-7.8	0
	8-30	9.4-23	---	6.1-7.8	0
	30-40	9.3-26	---	6.1-7.8	0
	40-60	15-25	---	6.1-7.8	0
485:					
Spillville,					
occasionally flooded	0-20	16-22	---	5.6-7.3	0
	20-54	16-22	---	5.6-7.3	0
	54-80	12-20	---	5.6-7.3	0
487B:					
Otter, frequently					
flooded-----	0-8	16-23	---	6.1-7.8	0
	8-27	16-23	---	6.1-7.8	0
	27-34	15-25	---	6.1-7.8	0
	34-41	12-23	---	6.1-8.4	0
	41-65	12-23	---	6.1-8.4	0
Worthen-----	0-8	13-19	---	5.6-7.3	0
	8-20	13-19	---	5.6-7.3	0
	20-29	13-19	---	5.6-7.3	0
	29-64	14-20	---	5.6-7.8	0
	64-80	9.8-17	---	5.6-7.8	0
489:					
Ossian, occasionally					
flooded-----	0-8	19-23	---	6.6-7.3	0
	8-15	19-23	---	6.6-7.3	0
	15-23	19-23	---	6.6-7.3	0
	23-32	17-25	---	6.6-7.8	0-15
	32-66	17-25	---	6.6-7.8	0-15
	66-80	17-25	---	6.6-7.8	0-15
491D2:					
Renova, moderately					
eroded-----	0-8	17-23	---	5.6-6.5	0
	8-19	---	11-16	4.5-6.0	0
	19-52	13-21	---	4.5-7.3	0
	52-60	13-21	---	7.4-7.8	0-25
491E2:					
Renova, moderately					
eroded-----	0-8	17-23	---	5.6-6.5	0
	8-19	---	11-16	4.5-6.0	0
	19-52	13-21	---	4.5-7.3	0
	52-60	13-21	---	7.4-7.8	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
499D:					
Nordness-----	0-4	16-20	---	5.6-7.3	0
	4-7	18-23	---	5.6-7.3	0
	7-13	18-23	---	5.6-7.3	0
	13-16	20-40	---	6.6-7.3	0
	16-80	---	---	---	---
499G:					
Nordness-----	0-4	16-20	---	5.6-7.3	0
	4-13	18-23	---	5.6-7.3	0
	13-16	20-40	---	6.6-7.3	0
	16-80	---	---	---	---
512B:					
Marlean-----	0-7	16-21	---	6.1-7.3	0-5
	7-9	16-21	---	6.1-7.3	0-5
	9-12	13-24	---	6.1-7.3	0-5
	12-80	20-25	---	7.4-7.8	5-20
512C:					
Marlean-----	0-8	16-21	---	6.1-7.3	0-5
	8-12	13-24	---	6.1-7.3	0-5
	12-80	20-25	---	7.4-7.8	5-20
512C2:					
Marlean, moderately eroded-----	0-8	16-21	---	6.1-7.3	0-5
	8-12	13-24	---	6.1-7.3	0-5
	12-80	20-25	---	7.4-7.8	5-20
512D2:					
Marlean, moderately eroded-----	0-8	16-21	---	6.1-7.3	0-5
	8-12	13-24	---	6.1-7.3	0-5
	12-80	20-25	---	7.4-7.8	5-20
512E2:					
Marlean, moderately eroded-----	0-8	16-21	---	6.1-7.3	0-5
	8-12	13-24	---	6.1-7.3	0-5
	12-80	20-25	---	7.4-7.8	5-20
582B:					
Kasson-----	0-8	16-21	---	5.1-7.3	0
	8-11	15-20	---	5.1-7.3	0
	11-20	15-20	---	5.1-7.3	0
	20-41	14-22	---	4.5-7.3	0
	41-53	14-22	---	4.5-7.3	0-25
	53-69	14-19	---	5.1-8.4	0-25
	69-80	14-19	---	5.1-8.4	0-25
582C:					
Kasson-----	0-8	16-21	---	5.1-7.3	0
	8-10	15-20	---	5.1-7.3	0
	10-14	15-20	---	5.1-7.3	0
	14-43	14-22	---	4.5-7.3	0
	43-59	14-22	---	4.5-7.3	0-25
	59-73	14-19	---	5.1-8.4	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
582C2: Kasson, moderately eroded-----	0-8	15-21	---	5.1-7.3	0
	8-43	14-22	---	4.5-7.3	0
	43-59	14-22	---	4.5-7.3	0-25
	59-73	14-19	---	5.1-8.4	0-25
626: Hayfield-----	0-8	16-23	---	5.6-7.3	0
	8-13	15-22	---	5.6-7.3	0
	13-29	13-24	---	5.1-6.0	0
	29-80	0.0-4.6	---	5.6-7.8	0
762B: Downs-----	0-8	13-22	---	5.1-7.3	0
	8-12	12-21	---	5.1-7.3	0
	12-17	12-21	---	5.1-7.3	0
	17-33	19-25	---	4.5-7.3	0
	33-48	14-23	---	5.6-7.3	0-15
	48-60	14-23	---	5.6-7.3	0-15
Tama-----	0-8	16-23	---	5.1-7.3	0
	8-14	20-27	---	5.1-7.3	0
	14-45	20-26	---	5.1-6.5	0
	45-60	14-23	---	5.6-7.3	0-15
762C: Downs-----	0-8	13-22	---	5.1-7.3	0
	8-12	12-21	---	5.1-7.3	0
	12-17	12-21	---	5.1-7.3	0
	17-33	19-25	---	4.5-7.3	0
	33-48	14-23	---	5.6-7.3	0-15
	48-60	14-23	---	5.6-7.3	0-15
Tama-----	0-8	16-23	---	5.1-7.3	0
	8-14	20-27	---	5.1-7.3	0
	14-45	20-26	---	5.1-6.5	0
	45-60	14-23	---	5.6-7.3	0-15
775B: Billett-----	0-8	4.8-13	---	5.1-7.3	0
	8-13	8.6-15	---	5.1-6.5	0
	13-28	7.6-15	---	5.1-6.5	0
	28-41	6.2-15	---	5.6-7.3	0
	41-47	6.2-15	---	5.6-7.3	0
	47-52	1.8-6.3	---	5.1-7.8	0-20
	52-60	1.8-6.3	---	5.1-7.8	0-20
775C: Billett-----	0-8	4.8-13	---	5.1-7.3	0
	8-13	8.6-15	---	5.1-6.5	0
	13-28	7.6-15	---	5.1-6.5	0
	28-41	6.2-15	---	5.6-7.3	0
	41-47	6.2-15	---	5.6-7.3	0
	47-52	1.8-6.3	---	5.1-7.8	0-20
	52-60	1.8-6.3	---	5.1-7.8	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
775D:					
Billett-----	0-8	4.8-13	---	5.1-7.3	0
	8-13	8.6-15	---	5.1-6.5	0
	13-28	7.6-15	---	5.1-6.5	0
	28-41	6.2-15	---	5.6-7.3	0
	41-47	6.2-15	---	5.6-7.3	0
	47-52	1.8-6.3	---	5.1-7.8	0-20
	52-60	1.8-6.3	---	5.1-7.8	0-20
782B:					
Donnan-----	0-8	13-22	---	5.1-7.3	0
	8-13	16-21	---	5.1-7.3	0
	13-18	16-21	---	5.1-7.3	0
	18-24	---	9.3-15	5.1-5.5	0
	24-34	28-40	---	5.1-6.5	0
	34-48	28-40	---	5.1-6.5	0
	48-60	17-25	---	5.1-6.5	0
793:					
Bertrand-----	0-8	13-19	---	5.6-7.3	0
	8-44	15-20	---	5.1-6.5	0
	44-55	15-20	---	5.1-6.5	0
	55-60	5.0-10	---	5.1-6.5	0
793B:					
Bertrand-----	0-8	13-19	---	5.6-7.3	0
	8-44	15-20	---	5.1-6.5	0
	44-55	15-20	---	5.1-6.5	0
	55-60	5.0-10	---	5.1-6.5	0
806B:					
Whalan-----	0-8	16-21	---	5.6-7.3	0
	8-12	15-27	---	5.1-6.5	0
	12-22	15-27	---	5.1-6.5	0
	22-24	23-43	---	5.6-7.8	0
	24-80	---	---	---	---
806C2:					
Whalan, moderately eroded-----	0-8	15-21	---	5.6-7.3	0
	8-22	15-27	---	5.1-6.5	0
	22-24	23-43	---	5.6-7.8	0
	24-80	---	---	---	---
806D:					
Whalan-----	0-8	16-21	---	5.6-7.3	0
	8-12	15-27	---	5.1-6.5	0
	12-22	15-27	---	5.1-6.5	0
	22-24	23-43	---	5.6-7.8	0
	24-80	---	---	---	---
813B:					
Atkinson-----	0-7	16-21	---	5.6-6.5	0
	7-13	16-21	---	5.6-6.5	0
	13-24	20-26	---	5.1-6.0	0
	24-45	17-28	---	5.1-6.0	0
	45-50	26-37	---	6.6-7.3	0
	50-80	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-	Effective	Soil	Calcium
		exchange capacity	cation- exchange capacity	reaction	carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
814:					
Rockton-----	0-8	16-23	---	5.1-7.3	0
	8-15	16-23	---	5.1-7.3	0
	15-26	20-27	---	5.1-6.5	0
	26-31	23-43	---	5.6-7.3	0
	31-80	---	---	---	---
814B:					
Rockton-----	0-8	16-23	---	5.1-7.3	0
	8-15	16-23	---	5.1-7.3	0
	15-26	20-27	---	5.1-6.5	0
	26-31	23-43	---	5.6-7.3	0
	31-80	---	---	---	---
814C:					
Rockton-----	0-8	16-23	---	5.1-7.3	0
	8-15	16-23	---	5.1-7.3	0
	15-26	20-27	---	5.1-6.5	0
	26-31	23-43	---	5.6-7.3	0
	31-80	---	---	---	---
814D:					
Rockton-----	0-8	16-23	---	5.1-7.3	0
	8-15	16-23	---	5.1-7.3	0
	15-26	20-27	---	5.1-6.5	0
	26-31	23-43	---	5.6-7.3	0
	31-80	---	---	---	---
837D2:					
Village, moderately eroded-----	0-8	15-21	---	5.1-7.3	0-2
	8-26	14-27	---	4.5-6.5	0-2
	26-31	14-27	---	4.5-6.5	0-2
	31-36	19-27	---	4.5-6.5	0-2
	36-50	---	20-33	3.6-6.0	0-2
	50-57	---	20-33	3.6-6.0	0-2
	57-60	11-30	---	5.1-7.3	0-2
837E2:					
Village, moderately eroded-----	0-8	15-21	---	5.1-7.3	0-2
	8-10	13-20	---	5.1-7.3	0-2
	10-31	14-27	---	4.5-6.5	0-2
	31-36	19-27	---	4.5-6.5	0-2
	36-57	---	20-33	3.6-6.0	0-2
	57-60	11-30	---	5.1-7.3	0-2
838D:					
Allamakee-----	0-8	11-21	---	5.1-7.3	0-2
	8-10	16-28	---	4.5-6.5	0-2
	10-16	16-27	---	4.5-6.5	0-2
	16-23	14-27	---	4.5-6.5	0-2
	23-27	---	16-33	3.6-6.0	0-2
	27-32	---	22-33	3.6-6.0	0-2
	32-48	---	22-33	3.6-6.0	0-2
	48-60	11-37	---	5.1-7.3	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-	Effective	Soil	Calcium
		exchange	cation-		
	In	capacity	exchange	pH	ate
		meq/100 g	capacity		Pct
838E:					
Allamakee-----	0-8	11-21	---	5.1-7.3	0-2
	8-16	16-27	---	4.5-6.5	0-2
	16-23	14-27	---	4.5-6.5	0-2
	23-27	---	16-33	3.6-6.0	0-2
	27-48	---	22-33	3.6-6.0	0-2
	48-60	11-37	---	5.1-7.3	0-2
840E:					
Lacrescent-----	0-10	16-25	---	6.6-7.3	0
	10-17	7.1-19	---	6.6-7.3	0
	17-28	6.2-16	---	7.4-7.8	0
	28-60	6.2-16	---	7.4-7.8	0-5
840G:					
Lacrescent-----	0-10	16-25	---	6.6-7.3	0
	10-17	7.1-19	---	6.6-7.3	0
	17-28	6.2-16	---	7.4-7.8	0
	28-60	6.2-16	---	7.4-7.8	0-5
841G:					
Boone-----	0-3	1.8-5.1	---	3.6-7.3	0
	3-8	0.0-2.6	---	3.6-7.3	0
	8-21	0.0-2.6	---	3.6-7.3	0
	21-35	0.0-2.6	---	3.6-7.3	0
	35-60	---	---	---	---
Rock outcrop.					
861E:					
Yellowriver-----	0-5	13-23	---	6.1-7.6	0-10
	5-12	10-27	---	6.1-7.6	0-10
	12-18	16-28	---	6.1-7.6	0-10
	18-26	16-27	---	6.1-7.6	0-10
	26-48	15-20	---	6.1-7.8	0-15
	48-60	15-20	---	6.1-7.8	0-15
861F:					
Yellowriver-----	0-5	13-23	---	6.1-7.6	0-10
	5-12	10-27	---	6.1-7.6	0-10
	12-26	16-27	---	6.1-7.6	0-10
	26-48	15-20	---	6.1-7.8	0-15
	48-60	15-20	---	6.1-7.8	0-15
903C:					
Frankville-----	0-8	13-21	---	6.6-7.3	0
	8-14	12-21	---	6.6-7.3	0
	14-18	12-21	---	6.6-7.3	0
	18-23	16-25	---	5.6-6.5	0
	23-28	26-40	---	6.1-7.3	0
	28-80	---	---	---	---
903D2:					
Frankville, moderately eroded---	0-8	13-21	---	6.6-7.3	0
	8-18	12-21	---	6.6-7.3	0
	18-23	16-25	---	5.6-6.5	0
	23-28	26-40	---	6.1-7.3	0
	28-80	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-	Effective	Soil	Calcium
		exchange capacity	cation- exchange capacity	reaction	carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
903E2: Frankville, moderately eroded---	0-8	13-21	---	6.6-7.3	0
	8-18	12-21	---	6.6-7.3	0
	18-23	16-25	---	5.6-6.5	0
	23-28	26-40	---	6.1-7.3	0
	28-80	---	---	---	---
912F: Paintcreek-----	0-4	11-21	---	5.1-7.3	0
	4-8	11-21	---	5.1-7.3	0
	8-11	16-24	---	4.5-6.5	0
	11-15	16-24	---	4.5-6.5	0
	15-35	---	16-33	3.6-6.0	0-1
	35-43	---	22-33	3.6-6.0	0-1
	43-60	---	22-33	3.6-6.0	0-1
914B: Winneshiek-----	0-8	16-23	---	5.6-7.3	0
	8-11	14-22	---	5.6-7.3	0
	11-16	14-22	---	5.6-7.3	0
	16-21	14-27	---	5.6-7.3	0
	21-24	26-41	---	5.6-7.3	0
	24-80	---	---	---	---
914C: Winneshiek-----	0-8	16-23	---	5.6-7.3	0
	8-16	14-22	---	5.6-7.3	0
	16-21	14-27	---	5.6-7.3	0
	21-24	26-41	---	5.6-7.3	0
	24-80	---	---	---	---
914D: Winneshiek-----	0-8	16-23	---	5.6-7.3	0
	8-16	14-22	---	5.6-7.3	0
	16-21	14-27	---	5.6-7.3	0
	21-24	26-41	---	5.6-7.3	0
	24-80	---	---	---	---
914E: Winneshiek-----	0-8	16-23	---	5.6-7.3	0
	8-16	14-22	---	5.6-7.3	0
	16-21	14-27	---	5.6-7.3	0
	21-24	26-41	---	5.6-7.3	0
	24-80	---	---	---	---
926: Canoe, rarely flooded	0-8	16-21	---	5.6-7.3	0
	8-23	17-22	---	5.1-6.0	0
	23-30	17-22	---	5.1-6.0	0
	30-49	13-24	---	5.1-6.5	0
	49-60	13-24	---	5.1-6.5	0
	60-72	13-24	---	5.1-6.5	0
965C2: Dubuque, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-22	18-27	---	5.1-6.0	0
	22-27	26-40	---	5.1-6.0	0
	27-80	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
965C2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
965D2:					
Dubuque, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-16	12-21	---	5.1-7.3	0
	16-22	18-27	---	5.1-6.0	0
	22-27	26-40	---	5.1-6.0	0
	27-80	---	---	---	---
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
965E2:					
Dubuque, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-16	12-21	---	5.1-7.3	0
	16-22	18-27	---	5.1-6.0	0
	22-27	26-40	---	5.1-6.0	0
	27-80	---	---	---	---
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
965G:					
Dubuque-----	0-3	13-22	---	5.1-7.3	0
	3-11	12-21	---	5.1-7.3	0
	11-16	12-21	---	5.1-7.3	0
	16-22	18-27	---	5.1-6.0	0
	22-27	26-40	---	5.1-6.0	0
	27-80	---	---	---	---
Fayette-----	0-3	13-22	---	5.1-7.3	0
	3-11	11-21	---	5.1-7.3	0
	11-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
978:					
Festina-----	0-8	16-21	---	5.6-7.3	0
	8-11	17-23	---	5.1-6.0	0
	11-20	15-20	---	5.1-6.5	0
	20-32	15-20	---	5.1-6.5	0
	32-65	15-20	---	5.1-6.5	0
	65-80	6.2-15	---	6.1-7.3	0
978B:					
Festina-----	0-8	16-21	---	5.6-7.3	0
	8-11	17-23	---	5.1-6.0	0
	11-65	15-20	---	5.1-6.5	0
	65-80	6.2-15	---	6.1-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1026:					
Bearpen, rarely flooded-----	0-8	8.9-21	---	5.1-7.3	0
	8-18	8.9-21	---	5.1-7.3	0
	18-41	13-24	---	5.1-7.3	0
	41-50	7.6-23	---	5.1-7.3	0
	50-60	7.6-23	---	5.1-8.4	0-15
1084:					
Bearpen, rarely flooded, overwash---	0-8	8.9-21	---	5.1-7.3	0
	8-18	8.9-21	---	5.1-7.3	0
	18-41	13-24	---	5.1-7.3	0
	41-50	7.6-23	---	5.1-7.3	0
	50-60	7.6-23	---	5.1-8.4	0-15
Lawson, rarely flooded, overwash---	0-8	9.4-23	---	6.1-7.8	0
	8-30	9.4-23	---	6.1-7.8	0
	30-40	9.3-26	---	6.1-7.8	0
	40-60	15-25	---	6.1-7.8	0
1152:					
Marshan, rarely flooded-----	0-8	22-30	---	5.6-7.3	0
	8-14	21-29	---	5.6-7.3	0
	14-18	20-29	---	5.6-7.3	0
	18-23	20-28	---	5.6-7.3	0
	23-30	15-24	---	5.6-7.3	0
	30-40	0.0-4.6	---	6.1-7.3	0
	40-60	0.0-4.6	---	6.1-7.3	0
1489B:					
Lawson, frequently flooded-----	0-8	9.4-23	---	6.1-7.8	0
	8-30	9.4-23	---	6.1-7.8	0
	30-40	9.3-26	---	6.1-7.8	0
	40-60	15-25	---	6.1-7.8	0
Ossian, frequently flooded-----	0-8	19-23	---	6.6-7.3	0
	8-15	19-23	---	6.6-7.3	0
	15-23	19-23	---	6.6-7.3	0
	23-66	17-25	---	6.6-7.8	0-15
	66-80	17-25	---	6.6-7.8	0-15
1763E2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
Exette, moderately eroded-----	0-8	15-22	---	6.6-7.3	0
	8-11	15-22	---	6.6-7.3	0
	11-33	13-21	---	5.6-7.3	0
	33-60	11-16	---	6.6-7.8	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
1763F2:					
Fayette, moderately eroded-----	0-8	13-22	---	5.1-7.3	0
	8-26	17-25	---	4.5-6.5	0
	26-47	14-23	---	5.1-7.8	0-15
	47-60	14-23	---	5.1-7.8	0-15
Exette, moderately eroded-----	0-8	15-22	---	6.6-7.3	0
	8-11	15-22	---	6.6-7.3	0
	11-33	13-21	---	5.6-7.3	0
	33-60	11-16	---	6.6-7.8	0-25
1936:					
Udifluvents, channeled, frequently flooded--	0-7	4.2-14	---	5.6-7.3	0
	7-44	3.1-12	---	5.6-7.3	0
	44-80	2.0-11	---	6.1-7.3	0
Spillville, channeled, frequently flooded--	0-20	16-22	---	5.6-7.3	0
	20-54	16-22	---	5.6-7.3	0
	54-80	12-20	---	5.6-7.3	0
2486:					
Spillville, occasionally flooded	0-8	16-22	---	5.6-7.3	0
	8-20	16-22	---	5.6-7.3	0
	20-54	16-22	---	5.6-7.3	0
	54-80	12-20	---	5.6-7.3	0
Waukee-----	0-8	16-21	---	5.6-6.5	0
	8-16	16-20	---	5.6-6.5	0
	16-20	15-22	---	5.1-6.0	0
	20-35	15-22	---	5.1-6.0	0
	35-44	1.8-7.1	---	5.6-6.5	0
	44-66	1.8-7.1	---	5.6-6.5	0
2551:					
Calamine-----	0-8	30-36	---	6.1-7.8	0
	8-20	30-36	---	6.1-7.8	0
	20-27	30-36	---	6.1-7.8	0-30
	27-34	36-41	---	7.6-8.6	5-30
	34-46	36-41	---	7.6-8.6	5-30
	46-60	---	---	---	---
Jacwin-----	0-8	21-27	---	6.1-7.3	0
	8-13	21-27	---	6.1-7.3	0
	13-24	17-26	---	6.1-7.3	0
	24-37	29-45	---	7.4-8.4	5-30
	37-80	---	---	---	---
2671:					
Ion, occasionally flooded-----	0-8	9.1-16	---	6.6-8.4	0-30
	8-36	9.1-16	---	6.6-8.4	0-30
	36-60	11-19	---	6.1-7.8	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Effective cation- exchange capacity	Soil reaction	Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
2671:					
Eitzen, occasionally flooded-----	0-8	16-21	---	5.6-7.3	0
	8-25	15-21	---	5.6-7.3	0
	25-48	16-23	---	5.1-6.5	0
	48-66	15-22	---	5.1-6.0	0
	66-72	15-22	---	5.1-6.0	0
5010.					
Pits, sand and gravel					
5030.					
Pits, limestone quarries					
5040, 5080.					
Udorthents					
AW.					
Animal waste lagoon					
SL.					
Sewage lagoon					
W.					
Water					

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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are *negligible, very low, low, medium, high, and very high*.

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	Hydro- logic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
27B: Terril-----	B	Low	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
41: Sparta-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
41B: Sparta-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
			41D: Sparta-----	A	Low	January	---	---	---	---
February	---	---				---	---	None	---	None
March	---	---				---	---	None	---	None
April	---	---				---	---	None	---	None
May	---	---				---	---	None	---	None
June	---	---				---	---	None	---	None
July	---	---				---	---	None	---	None
August	---	---				---	---	None	---	None
September	---	---				---	---	None	---	None
October	---	---				---	---	None	---	None
November	---	---				---	---	None	---	None
December	---	---				---	---	None	---	None
63B: Chelsea-----	A	Very low				January	---	---	---	---
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
63D: Chelsea-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
84: Clyde-----	B/D	Low	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
85: Eitzen, occasionally flooded-----	B	Low	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	Very brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Very brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Very brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Very brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			September	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Very brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
98: Huntsville, occasionally flooded-----	B	Low	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
98B: Huntsville, occasionally flooded-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			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
109B: Backbone-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
109C: Backbone-----	B	Medium		Ft	Ft	Ft				
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
109D: Backbone-----	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
135: Coland, occasionally flooded-----	B/D	Low								
			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	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	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
136B: Ankeny-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
162B: Downs-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
162C: Downs-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
162D: Downs-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
162E2: Downs, moderately eroded--	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
163B: Fayette-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
163C2: Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
163D2: Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
163E2: Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
163F: Fayette-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
163G: Fayette-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
175B: Dickinson-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
177C2: Saude, moderately eroded--	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
178: Waukee-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
178B: Waukee-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
196: Volney, occasionally flooded-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	Very brief	Occasional
			April	---	---	---	---	None	Very brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Occasional
			July	---	---	---	---	None	Very brief	Occasional
			August	---	---	---	---	None	Very brief	Occasional
			September	---	---	---	---	None	Very brief	Occasional
			October	---	---	---	---	None	Very brief	Occasional
			November	---	---	---	---	None	Very brief	Occasional
			December	---	---	---	---	None	---	None
196+: Volney, occasionally flooded, overwash-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	Very brief	Occasional
			April	---	---	---	---	None	Very brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			June	---	---	---	---	None	Very brief	Occasional
			July	---	---	---	---	None	Very brief	Occasional
			August	---	---	---	---	None	Very brief	Occasional
			September	---	---	---	---	None	Very brief	Occasional
			October	---	---	---	---	None	Very brief	Occasional
			November	---	---	---	---	None	Very brief	Occasional
			December	---	---	---	---	None	---	None
196B: Volney, rarely flooded----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	Very brief	Rare
			March	---	---	---	---	None	Very brief	Rare
			April	---	---	---	---	None	Very brief	Rare
			May	---	---	---	---	None	Very brief	Rare
			June	---	---	---	---	None	Very brief	Rare
			July	---	---	---	---	None	Very brief	Rare
			August	---	---	---	---	None	Very brief	Rare
			September	---	---	---	---	None	Very brief	Rare
			October	---	---	---	---	None	Very brief	Rare
			November	---	---	---	---	None	Very brief	Rare
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
198B: Floyd-----	B	Low	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	3.0-5.5	>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
221: Klossner-----	A/D	Very low	January	0.0	>6.0	---	---	None	---	None
			February	0.0	>6.0	---	---	None	---	None
			March	0.0	>6.0	---	---	None	---	None
			April	0.0	>6.0	---	---	None	---	None
			May	0.0	>6.0	---	---	None	---	None
			June	0.0	>6.0	---	---	None	---	None
			July	0.0	>6.0	---	---	None	---	None
			August	0.0	>6.0	---	---	None	---	None
			September	0.0	>6.0	---	---	None	---	None
			October	0.0	>6.0	---	---	None	---	None
			November	0.0	>6.0	---	---	None	---	None
			December	0.0	>6.0	---	---	None	---	None
221+: Klossner, occasionally flooded, overwash-----	A/D	Low	January	0.0	>6.0	---	---	None	---	None
			February	0.0	>6.0	---	---	None	---	None
			March	0.0	>6.0	---	---	None	Very brief	Occasional
			April	0.0	>6.0	---	---	None	Very brief	Occasional
			May	0.0	>6.0	---	---	None	Very brief	Occasional
			June	0.0	>6.0	---	---	None	Very brief	Occasional
			July	0.0	>6.0	---	---	None	Very brief	Occasional
			August	0.0	>6.0	---	---	None	Very brief	Occasional
			September	0.0	>6.0	---	---	None	Very brief	Occasional
			October	0.0	>6.0	---	---	None	Very brief	Occasional
			November	0.0	>6.0	---	---	None	Very brief	Occasional
			December	0.0	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
235: Turlin, rarely flooded----	B	Low	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	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
Coland, occasionally flooded-----	B/D	Low	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	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
241B: Lilah-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
241B: Dickinson-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
241C: Lilah-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Dickinson-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
241D: Lilah-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Dickinson-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
285B: Burkhardt-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
285F: Burkhardt-----	A	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
291B: Atterberry-----	B	Low	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	3.0-5.5	>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
302B: Coggon-----	B	Low	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	Hydro- logic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
302C: Coggon-----	B	Medium	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
302C2: Coggon, moderately eroded	B	Medium	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
320: Arenzville, occasionally flooded-----	B	Low	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	---	---	---	---	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	Hydro- logic group	Surface runoff	Months	Water table		Surface water depth	Ponding		Flooding	
				Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
391B: Clyde-----	B/D	Low	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
Floyd-----	B	Low	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	3.0-5.5	>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
394B: Ostrander-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
394C: Ostrander-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
395B: Marquis-----	D	Low	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
444: Jacwin-----	D	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	1.5-2.0	2.5-2.5	---	---	None	---	None
			April	1.0-1.5	2.5-2.5	---	---	None	---	None
			May	1.0-1.5	2.5-2.5	---	---	None	---	None
			June	1.5-2.0	2.5-2.5	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	1.0-1.5	2.5-2.5	---	---	None	---	None
			November	1.5-2.0	2.5-2.5	---	---	None	---	None
			December	1.5-2.0	2.5-2.5	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
444B: Jacwin-----	D	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	1.5-2.0	2.5-2.5	---	---	None	---	None
			April	1.0-1.5	2.5-2.5	---	---	None	---	None
			May	1.0-1.5	2.5-2.5	---	---	None	---	None
			June	1.5-2.0	2.5-2.5	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	1.0-1.5	2.5-2.5	---	---	None	---	None
			November	1.5-2.0	2.5-2.5	---	---	None	---	None
			December	1.5-2.0	2.5-2.5	---	---	None	---	None
444C: Jacwin-----	D	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	1.5-2.0	2.5-2.5	---	---	None	---	None
			April	1.0-1.5	2.5-2.5	---	---	None	---	None
			May	1.0-1.5	2.5-2.5	---	---	None	---	None
			June	1.5-2.0	2.5-2.5	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	1.0-1.5	2.5-2.5	---	---	None	---	None
			November	1.5-2.0	2.5-2.5	---	---	None	---	None
			December	1.5-2.0	2.5-2.5	---	---	None	---	None
468B: Dunkerton-----	B	Low	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	3.0-5.5	>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	Hydro- logic group	Surface runoff	Months	Water table		Surface water depth	Ponding		Flooding	
				Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
471: Oran-----	B	Low	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	3.0-5.5	>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
471B: Oran-----	B	Low	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	3.0-5.5	>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
480B: Orwood-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
480C2: Orwood, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
480D2: Orwood, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
480E2: Orwood, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
480E3: Orwood, severely eroded---	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
480F2: Orwood, moderately eroded	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
482B: Racine-----	D	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
484: Lawson, occasionally flooded-----	B	Low	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	Brief	Occasional
			April	1.0-3.5	>6.0	---	---	None	Brief	Occasional
			May	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			June	3.0-5.5	>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
485: Spillville, occasionally flooded-----	B	Low	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	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
487B: Otter, frequently flooded	B/D	Low	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	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	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
487B: Worthen-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
489: Ossian, occasionally flooded-----	B/D	Low	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	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
491D2: Renova, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
491E2: Renova, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
499D: Nordness-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
499G: Nordness-----	B	Very high	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
512B: Marlean-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
512C: Marlean-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
512C2: Marlean, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
512D2: Marlean, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
512E2: Marlean, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
582B: Kasson-----	D	Low	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	Hydro- logic group	Surface runoff	Months	Water table		Surface water depth	Ponding		Flooding	
				Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
582C: Kasson-----	D	Medium	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
582C2: Kasson, moderately eroded	D	Medium	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
626: Hayfield-----	B	Low	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	3.0-5.5	>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	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
762B: Downs-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Tama-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
762C: Downs-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
762C: Tama-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
775B: Billett-----	A	Very low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
775C: Billett-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
775D: Billett-----	A	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
782B: Donnan-----	D	Low	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	3.0-5.5	>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
793: Bertrand-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
793B: Bertrand-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
806B: Whalan-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
806C2: Whalan, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
806D: Whalan-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
813B: Atkinson-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
814: Rockton-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
814B: Rockton-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
814C: Rockton-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
814D: Rockton-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
837D2: Village, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
837E2: Village, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
838D: Allamakee-----	D	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
838E: Allamakee-----	D	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
840E: Lacrescent-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
840G: Lacrescent-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
841G: Boone-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Rock outcrop-----	---	High	Jan-Dec	---	---	---	---	None	---	---
861E: Yellowriver-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
861F: Yellowriver-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
903C: Frankville-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
903D2: Frankville, moderately eroded-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
903E2: Frankville, moderately eroded-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
			912F: Paintcreek-----	C	High	January	---	---	---	---
February	---	---				---	---	None	---	None
March	---	---				---	---	None	---	None
April	---	---				---	---	None	---	None
May	---	---				---	---	None	---	None
June	---	---				---	---	None	---	None
July	---	---				---	---	None	---	None
August	---	---				---	---	None	---	None
September	---	---				---	---	None	---	None
October	---	---				---	---	None	---	None
November	---	---				---	---	None	---	None
December	---	---				---	---	None	---	None
914B: Winneshiek-----	B	Low				January	---	---	---	---
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
914C: Winneshiek-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
914D: Winneshiek-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
914E: Winneshiek-----	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
926: Canoe, rarely flooded-----	B	Low	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	Brief	Rare
			April	1.0-3.5	>6.0	---	---	None	Brief	Rare
			May	1.5-4.0	>6.0	---	---	None	Brief	Rare
			June	3.0-5.5	>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
965C2: Dubuque, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
965D2: Dubuque, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
965E2: Dubuque, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
965E2: Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
965G: Dubuque-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Fayette-----	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
978: Festina-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
978B: Festina-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
1026: Bearpen, rarely flooded---	B/D	Low	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	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	3.0-5.5	>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

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1084: Bearpen, rarely flooded, overwash-----	B/D	Low	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	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	3.0-5.5	>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
			Lawson, rarely flooded, overwash-----	B	Low	January	3.0-5.5	>6.0	---	---
February	2.5-5.0	>6.0				---	---	None	---	None
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	3.0-5.5	>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
1152: Marshan, rarely flooded---	B/D	Low				January	2.0-3.5	>6.0	---	---
			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

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1489B: Lawson, frequently flooded	B	Low	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	Very brief	Frequent
			April	1.0-3.5	>6.0	---	---	None	Very brief	Frequent
			May	1.5-4.0	>6.0	---	---	None	Very brief	Frequent
			June	3.0-5.5	>6.0	---	---	None	Very brief	Frequent
			July	3.0-5.5	>6.0	---	---	None	Very brief	Frequent
			August	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			September	4.0-6.5	>6.0	---	---	None	Very brief	Frequent
			October	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			November	2.5-5.0	>6.0	---	---	None	Very brief	Frequent
			December	3.0-5.5	>6.0	---	---	None	---	None
Ossian, frequently flooded	B/D	Low	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	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
1763E2: Fayette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1763E2: Exette, moderately eroded	B	Medium	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
1763F2: Fayette, moderately eroded	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Exette, moderately eroded	B	High	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1936: Udifluvents, channeled, frequently flooded-----	A	Low								
			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	Brief	Frequent
			April	4.0-6.0	>6.0	---	---	None	Brief	Frequent
			May	4.5-6.5	>6.0	---	---	None	Brief	Frequent
			June	5.0-6.7	>6.0	---	---	None	Brief	Frequent
			July	6.0-6.7	>6.0	---	---	None	Brief	Frequent
			August	6.5-6.7	>6.0	---	---	None	Brief	Frequent
			September	6.5-6.7	>6.0	---	---	None	Brief	Frequent
			October	6.5-6.7	>6.0	---	---	None	Brief	Frequent
			November	5.5-6.7	>6.0	---	---	None	Brief	Frequent
			December	6.0-6.7	>6.0	---	---	None	---	None
Spillville, channeled, frequently flooded-----	B	Low								
			January	3.0-5.5	>6.0	---	---	None	---	None
			February	2.5-5.0	>6.0	---	---	None	Very brief	Frequent
			March	1.5-4.0	>6.0	---	---	None	Very brief	Frequent
			April	1.0-3.5	>6.0	---	---	None	Very brief	Frequent
			May	1.5-4.0	>6.0	---	---	None	Very brief	Frequent
			June	2.0-4.5	>6.0	---	---	None	Very brief	Frequent
			July	3.0-5.5	>6.0	---	---	None	Very brief	Frequent
			August	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			September	4.0-6.5	>6.0	---	---	None	Very brief	Frequent
			October	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			November	2.5-5.0	>6.0	---	---	None	Very brief	Frequent
			December	3.0-5.5	>6.0	---	---	None	---	None
2486: Spillville, occasionally flooded-----	B	Low								
			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	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

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
2486: Waukee-----	B	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
2551: Calamine-----	D	Low	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
Jacwin-----	D	Low	January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	1.5-2.0	2.5-2.5	---	---	None	---	None
			April	1.0-1.5	2.5-2.5	---	---	None	---	None
			May	1.0-1.5	2.5-2.5	---	---	None	---	None
			June	1.5-2.0	2.5-2.5	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	1.0-1.5	2.5-2.5	---	---	None	---	None
			November	1.5-2.0	2.5-2.5	---	---	None	---	None
			December	1.5-2.0	2.5-2.5	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table		Surface water depth	Ponding		Flooding	
				Upper limit	Lower limit		Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
2671: Ion, occasionally flooded	B	Low	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	Very brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Very brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Very brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Very brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			September	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Very brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None
Eitzen, occasionally flooded-----	B	Low	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	Very brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Very brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Very brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Very brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Very brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			September	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Very brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Very brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None
5010. Pits, sand and gravel										
5030. Pits, limestone quarries										
5040, 5080. Udorthents										
AW. Animal waste lagoon										

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Months	Water table			Ponding		Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
SL. Sewage lagoon				Ft	Ft	Ft				
W. Water										

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.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
27B: Terril-----	---	---	---	---	---	Moderate	Moderate	Low
41: Sparta-----	---	---	---	---	---	Low	Low	Moderate
41B: Sparta-----	---	---	---	---	---	Low	Low	Moderate
41D: Sparta-----	---	---	---	---	---	Low	Low	Moderate
63B: Chelsea-----	---	---	---	---	---	Low	Low	Low
63D: Chelsea-----	---	---	---	---	---	Low	Low	Low
84: Clyde-----	---	---	---	---	---	High	High	Low
85: Eitzen, occasionally flooded-----	---	---	---	---	---	High	Low	Moderate
98: Huntsville, occasionally flooded--	---	---	---	---	---	High	Low	Low
98B: Huntsville, occasionally flooded--	---	---	---	---	---	High	Low	Low
109B: Backbone-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
109C: Backbone-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
109D: Backbone-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
135: Coland, occasionally flooded-----	---	---	---	---	---	High	High	Low
136B: Ankeny-----	---	---	---	---	---	Moderate	Low	Low
162B: Downs-----	---	---	---	---	---	High	Moderate	Moderate
162C: Downs-----	---	---	---	---	---	High	Moderate	Moderate
162D: Downs-----	---	---	---	---	---	High	Moderate	Moderate
162E2: Downs, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
163B: Fayette-----	---	---	---	---	---	High	Moderate	Moderate
163C2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
163D2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
163E2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
163F: Fayette-----	---	---	---	---	---	High	Moderate	Moderate
163G: Fayette-----	---	---	---	---	---	High	Moderate	Moderate
175B: Dickinson-----	---	---	---	---	---	Moderate	Low	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
177C2: Saude, moderately eroded-----	---	In	---	---	---	Low	Low	Moderate
178: Waukee-----	---	---	---	---	---	Low	Low	Moderate
178B: Waukee-----	---	---	---	---	---	Low	Low	Moderate
196: Volney, occasionally flooded-----	---	---	---	---	---	Low	Low	Low
196+: Volney, occasionally flooded, overwash-----	---	---	---	---	---	Low	Low	Low
196B: Volney, rarely flooded	---	---	---	---	---	Low	Low	Low
198B: Floyd-----	---	---	---	---	---	High	High	Low
221: Klossner-----	---	---	---	4-15	25-32	High	High	Moderate
221+: Klossner, occasionally flooded, overwash-----	---	---	---	2-4	25-32	High	Moderate	Moderate
235: Turlin, rarely flooded	---	---	---	---	---	Moderate	High	Moderate
Coland, occasionally flooded-----	---	---	---	---	---	High	High	Low
241B: Lilah-----	---	---	---	---	---	Low	Low	High
Dickinson-----	---	---	---	---	---	Moderate	Low	Moderate
241C: Lilah-----	---	---	---	---	---	Low	Low	High
Dickinson-----	---	---	---	---	---	Moderate	Low	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
241D: Lilah-----	---	---	---	---	---	Low	Low	High
Dickinson-----	---	---	---	---	---	Moderate	Low	Moderate
285B: Burkhardt-----	---	---	---	---	---	Low	Low	High
285F: Burkhardt-----	---	---	---	---	---	Low	Low	High
291B: Atterberry-----	---	---	---	---	---	High	High	Moderate
302B: Coggon-----	---	---	---	---	---	Moderate	Moderate	Moderate
302C: Coggon-----	---	---	---	---	---	Moderate	Moderate	Moderate
302C2: Coggon, moderately eroded-----	---	---	---	---	---	Moderate	Moderate	Moderate
320: Arenzville, occasionally flooded--	---	---	---	---	---	High	Moderate	Moderate
391B: Clyde-----	---	---	---	---	---	High	High	Low
Floyd-----	---	---	---	---	---	High	High	Low
394B: Ostrander-----	---	---	---	---	---	Moderate	Moderate	Low
394C: Ostrander-----	---	---	---	---	---	Moderate	Moderate	Low
395B: Marquis-----	---	---	---	---	---	Moderate	Moderate	Moderate
444: Jacwin-----	Paralithic bedrock	30-50	Extremely weakly cemented	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
444B: Jacwin-----	Paralithic bedrock	30-50	Extremely weakly cemented	---	---	High	High	Low
444C: Jacwin-----	Paralithic bedrock	30-50	Extremely weakly cemented	---	---	High	High	Low
468B: Dunkerton-----	---	---	---	---	---	Moderate	Moderate	Moderate
471: Oran-----	---	---	---	---	---	High	High	Moderate
471B: Oran-----	---	---	---	---	---	High	High	Moderate
480B: Orwood-----	---	---	---	---	---	Moderate	Low	Moderate
480C2: Orwood, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
480D2: Orwood, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
480E2: Orwood, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
480E3: Orwood, severely eroded	---	---	---	---	---	Moderate	Low	Moderate
480F2: Orwood, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
482B: Racine-----	---	---	---	---	---	Moderate	Low	Moderate
484: Lawson, occasionally flooded-----	---	---	---	---	---	High	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
485: Spillville, occasionally flooded--	---	---	---	---	---	Moderate	High	Moderate
487B: Otter, frequently flooded-----	---	---	---	---	---	High	High	Low
Worthen-----	---	---	---	---	---	High	Low	Low
489: Ossian, occasionally flooded-----	---	---	---	---	---	High	High	Low
491D2: Renova, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
491E2: Renova, moderately eroded-----	---	---	---	---	---	Moderate	Low	Moderate
499D: Nordness-----	Lithic bedrock	8-20	Indurated	---	---	Low	Low	Low
499G: Nordness-----	Lithic bedrock	8-20	Indurated	---	---	Low	Low	Low
512B: Marlean-----	---	---	---	---	---	Low	Low	Low
512C: Marlean-----	---	---	---	---	---	Low	Low	Low
512C2: Marlean, moderately eroded-----	---	---	---	---	---	Low	Low	Low
512D2: Marlean, moderately eroded-----	---	---	---	---	---	Low	Low	Low
512E2: Marlean, moderately eroded-----	---	---	---	---	---	Low	Low	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
582B: Kasson-----	---	---	---	---	---	Moderate	Moderate	Moderate
582C: Kasson-----	---	---	---	---	---	Moderate	Moderate	Moderate
582C2: Kasson, moderately eroded-----	---	---	---	---	---	Moderate	Moderate	Moderate
626: Hayfield-----	---	---	---	---	---	High	Low	Moderate
762B: Downs-----	---	---	---	---	---	High	Moderate	Moderate
Tama-----	---	---	---	---	---	High	Moderate	Moderate
762C: Downs-----	---	---	---	---	---	High	Moderate	Moderate
Tama-----	---	---	---	---	---	High	Moderate	Moderate
775B: Billett-----	---	---	---	---	---	Moderate	Low	Moderate
775C: Billett-----	---	---	---	---	---	Moderate	Low	Moderate
775D: Billett-----	---	---	---	---	---	Moderate	Low	Moderate
782B: Donnan-----	---	---	---	---	---	High	High	Moderate
793: Bertrand-----	---	---	---	---	---	High	Low	Moderate
793B: Bertrand-----	---	---	---	---	---	High	Low	Moderate
806B: Whalan-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
806C2: Whalan, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Low
806D: Whalan-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Low
813B: Atkinson-----	Lithic bedrock	40-55	Indurated	---	---	Moderate	Moderate	Moderate
814: Rockton-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
814B: Rockton-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
814C: Rockton-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
814D: Rockton-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Low	Low
837D2: Village, moderately eroded-----	---	---	---	---	---	High	Moderate	High
837E2: Village, moderately eroded-----	---	---	---	---	---	High	Moderate	High
838D: Allamakee-----	---	---	---	---	---	High	Moderate	High
838E: Allamakee-----	---	---	---	---	---	High	Moderate	High
840E: Lacrescent-----	---	---	---	---	---	Moderate	Low	Low
840G: Lacrescent-----	---	---	---	---	---	Moderate	Low	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
841G: Boone-----	Paralithic bedrock	20-40	Extremely weakly cemented	---	---	Low	Low	Moderate
Rock outcrop-----	Lithic bedrock	0	Indurated	---	---	---	---	---
861E: Yellowriver-----	---	---	---	---	---	High	Moderate	Moderate
861F: Yellowriver-----	---	---	---	---	---	High	Moderate	Moderate
903C: Frankville-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
903D2: Frankville, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
903E2: Frankville, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
912F: Paintcreek-----	---	---	---	---	---	High	Moderate	High
914B: Winneshiek-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Moderate
914C: Winneshiek-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Moderate
914D: Winneshiek-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Moderate
914E: Winneshiek-----	Lithic bedrock	20-40	Indurated	---	---	Moderate	Moderate	Moderate
926: Canoe, rarely flooded--	---	---	---	---	---	High	High	Moderate
965C2: Dubuque, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
965C2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
965D2: Dubuque, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
965E2: Dubuque, moderately eroded-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
965G: Dubuque-----	Lithic bedrock	20-40	Indurated	---	---	High	Moderate	Moderate
Fayette-----	---	---	---	---	---	High	Moderate	Moderate
978: Festina-----	---	---	---	---	---	High	Moderate	Moderate
978B: Festina-----	---	---	---	---	---	High	Moderate	Moderate
1026: Bearpen, rarely flooded	---	---	---	---	---	High	High	Moderate
1084: Bearpen, rarely flooded, overwash----	---	---	---	---	---	High	High	Moderate
Lawson, rarely flooded, overwash-----	---	---	---	---	---	High	Moderate	Low
1152: Marshan, rarely flooded	---	---	---	---	---	High	High	Moderate
1489B: Lawson, frequently flooded-----	---	---	---	---	---	High	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
1489B: Ossian, frequently flooded-----	---	---	---	---	---	High	High	Low
1763E2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
Exette, moderately eroded-----	---	---	---	---	---	High	Low	Low
1763F2: Fayette, moderately eroded-----	---	---	---	---	---	High	Moderate	Moderate
Exette, moderately eroded-----	---	---	---	---	---	High	Low	Low
1936: Udifluvents, channeled, frequently flooded----	---	---	---	---	---	Moderate	Low	Low
Spillville, channeled, frequently flooded----	---	---	---	---	---	Moderate	High	Moderate
2486: Spillville, occasionally flooded--	---	---	---	---	---	Moderate	High	Moderate
Waukee-----	---	---	---	---	---	Low	Low	Moderate
2551: Calamine-----	Paralithic bedrock	40-60	Extremely weakly cemented	---	---	Moderate	High	Moderate
Jacwin-----	Paralithic bedrock	30-50	Extremely weakly cemented	---	---	High	High	Low
2671: Ion, occasionally flooded-----	---	---	---	---	---	High	Moderate	Low
Eitzen, occasionally flooded-----	---	---	---	---	---	High	Low	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
5010. Pits, sand and gravel								
5030. Pits, limestone quarries								
5040, 5080. Udorthents								
AW. Animal waste lagoon								
SL. Sewage lagoon								
W. Water								

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