



NRCS

Natural Resources Conservation Service

Iowa Department of Agriculture and Land Stewardship 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 Adams County, lowa

Part II

IOWA STATE UNIVERSITY

lowa 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 2006. Soil names and descriptions were approved in 2007. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2006. 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 Adams 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: A pond in an area of the Ladoga-Gara association provides erosion control and a source of water for livestock.

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 Adams County, Iowa

Introduction to Part II

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

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

This part of the soil survey includes interpretations for various uses of the soils and data on soil properties. This information can be used to plan the use and management of soils for crops and pasture or as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

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

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

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

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

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate

the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

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

Numerical Ratings

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

Classification of the Soils

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

Soil name	Family or higher taxonomic class
Adair	 Fine, smectitic, mesic Aquertic Hapludalfs
Aquolls	Aquolls
Armstrong	Fine, smectitic, mesic Aquertic Hapludalfs
Bremer	Fine, smectitic, mesic Typic Argiaquolls
Bucknell	Fine, smectitic, mesic Vertic Epiaqualfs
Clarinda	Fine, smectitic, mesic Vertic Argiaquolls
Clarinda	Fine, smectitic, mesic Vertic Epiaqualfs
Clearfield	Fine, smectitic, mesic Typic Endoaquolls
Dickman	Sandy, mixed, mesic Typic Dystrudepts
Ely	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Gara	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs
Hedrick	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Humeston	Fine, smectitic, mesic Argiaquic Argialbolls
Judson	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Kennebec	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Ladoga	Fine, smectitic, mesic Mollic Hapludalfs
Lamoni	Fine, smectitic, mesic Vertic Epiaqualfs
Macksburg	Fine, smectitic, mesic Aquic Argiudolls
Mt. Sterling	Fine-silty, mixed, superactive, nonacid, mesic Aeric Fluvaquents
Nevin	Fine-silty, mixed, superactive, mesic Aquic Pachic Argiudolls
Nira	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludolls
Nira	Fine-silty, mixed, superactive, mesic Oxyaquic Dystrudepts
Nodaway	Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Olmitz	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Sharpsburg	Fine, smectitic, mesic Typic Argiudolls
Sharpsburg	Fine, smectitic, mesic Mollic Hapludalfs
Shelby	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Shelby	Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs
Shelby	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Winterset Wiota	Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Acreage and Proportionate Extent of the Soils

Map	Soil name	Acres	Percent
symbol			
7	Wiota silty clay loam, 0 to 2 percent slopes, rarely flooded	209	*
7B	Wiota silty clay loam, 2 to 5 percent slopes, rarely flooded	555	0.2
8B	Judson silty clay loam, 2 to 5 percent slopes	2,747	1.0
15B	Olmitz-Ely-Zook complex, 2 to 5 percent slopes	4,440	1.6
16	Nodaway-Kennebec complex, 0 to 2 percent slopes, occasionally flooded	1,175	0.4
24C2	Shelby clay loam, 5 to 9 percent slopes, moderately eroded	186	*
24D2	Shelby clay loam, 9 to 14 percent slopes, moderately eroded	10,146	3.7
24E	Shelby clay loam, 14 to 18 percent slopes	2,117	0.8
24E2	Shelby clay loam, 14 to 18 percent slopes, moderately eroded	9,780	3.6
24F	Shelby clay loam, 18 to 25 percent slopes	1,240	0.5
43	Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded	642	0.2
45B	Zook-Ely complex, 2 to 5 percent slopes	4,850	1.8
54	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	8,436	3.1
54+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	2,251	0.8
76B	Ladoga silt loam, 2 to 5 percent slopes	892	0.3
76C	Ladoga silt loam, 5 to 9 percent slopes	7,692	2.8
76D	Ladoga silt loam, 9 to 14 percent slopes	873	0.3
76D2	Ladoga silt loam, 9 to 14 percent slopes, moderately eroded	3,426	1.3
86	$ {\tt Mt. Sterling-Zook, \ overwash, \ complex, \ 0 \ to \ 2 \ percent \ slopes, \ occasionally} $		
	flooded	433	0.2
88	Nevin silt loam, 0 to 2 percent slopes, rarely flooded	1,079	0.4
93D2	Shelby-Adair complex, 9 to 14 percent slopes, moderately eroded	3,445	1.3
93E2	Shelby-Adair complex, 14 to 18 percent slopes, moderately eroded	3,608	1.3
172	$ {\tt Wabash \; silty \; clay, \; frequently \; ponded, \; 0 \; to \; 2 \; percent \; slopes, \; occasionally} $		
	flooded	532	0.2
179E	Gara loam, 14 to 18 percent slopes	5,469	2.0
179F	Gara loam, 18 to 25 percent slopes	2,314	0.8
179G	Gara loam, 25 to 40 percent slopes	142	*
192D2	Adair clay loam, 9 to 14 percent slopes, moderately eroded	1,273	0.5
220	Nodaway silt loam, 0 to 2 percent slopes, occasionally flooded	4,460	1.6
222C2	Clarinda silty clay loam, 5 to 9 percent slopes, moderately eroded	5,019	1.8
222D	Clarinda silty clay loam, 9 to 14 percent slopes	1,594	0.6
222D2	Clarinda silty clay loam, 9 to 14 percent slopes, moderately eroded	1,206	0.4
222D3	Clarinda silty clay, 9 to 14 percent slopes, severely eroded	136	*
248	Wabash silty clay loam, occasionally ponded, 0 to 2 percent slopes,		
	occasionally flooded	3,779	1.4
269	Humeston silt loam, 0 to 2 percent slopes, occasionally flooded	240	*
273B	Olmitz loam, 2 to 5 percent slopes	409	0.1
273C	Olmitz loam, 5 to 9 percent slopes	498	0.2
324C2	Dickman fine sandy loam, loamy substratum, 5 to 9 percent slopes,		
	moderately eroded	89	*
324D2	Dickman fine sandy loam, loamy substratum, 9 to 14 percent slopes,		
	moderately eroded	90	*
354	Aquolls, ponded, 0 to 1 percent slopes	48	*
368	Macksburg silty clay loam, 0 to 2 percent slopes	5,725	2.1
369	Winterset silty clay loam, 0 to 2 percent slopes	966	0.4

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
			İ
370	Sharpsburg silty clay loam, 0 to 2 percent slopes	350	0.1
370B	Sharpsburg silty clay loam, 2 to 5 percent slopes	23,628	8.7
371C2	Sharpsburg-Nira complex, 5 to 9 percent slopes, moderately eroded	39,670	14.5
371D2	Sharpsburg-Nira complex, 9 to 14 percent slopes, moderately eroded	9,685	3.6
421C2	Gara-Bucknell complex, 5 to 9 percent slopes, moderately eroded	357	0.1
421D2	Gara-Bucknell complex, 9 to 14 percent slopes, moderately eroded	8,266	3.0
421E2	Gara-Bucknell complex, 14 to 18 percent slopes, moderately eroded	754	0.3
435	Zook-Mt. Sterling complex, 0 to 2 percent slopes, occasionally flooded	3,609	1.3
469C2	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, moderately eroded	5,956	2.2
469C3	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, severely eroded	217	*
470D2	Lamoni-Shelby complex, 9 to 14 percent slopes, moderately eroded	22,560	8.3
545B	Zook-Ely-Gullied land complex, 2 to 5 percent slopes	32,583	11.9
569C	Nira-Clearfield complex, 5 to 9 percent slopes	10,855	4.0
579E3	Bucknell-Hedrick complex, 14 to 18 percent slopes, severely eroded	247	*
794C2	Armstrong-Ladoga complex, 5 to 9 percent slopes, moderately eroded	72	*
822D2	Lamoni silty clay loam, 9 to 14 percent slopes, moderately eroded	1,068	0.4
870B	Sharpsburg silty clay loam, terrace, 1 to 5 percent slopes	1,005	0.4
870C2	Sharpsburg silty clay loam, terrace, 5 to 9 percent slopes, moderately		
	eroded	467	0.2
870D2	Sharpsburg silty clay loam, terrace, 9 to 14 percent slopes, moderately		
	eroded	118	*
876B	Ladoga silt loam, terrace, 1 to 5 percent slopes	920	0.3
876C2	Ladoga silt loam, terrace, 5 to 9 percent slopes, moderately eroded	627	0.2
876D2	Ladoga silt loam, terrace, 9 to 14 percent slopes, moderately eroded	303	0.1
2368B	Macksburg-Nira complex, 2 to 5 percent slopes	1,888	0.7
5030	Pits, limestone quarries	136	*
5040	Udorthents, loamy	335	0.1
5041	Udorthents, reclaimed	164	*
AW	Animal waste lagoon	6	*
SL	Sewage lagoon	8	*
W	Water	2,635	1.0
		272,700	100.0

^{*} Less than 0.1 percent.

Agronomy

This section provides some general information about managing the soils for crops and for hay and pasture. The lowa 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
7: Wiota, rarely flooded	85	 - Potential for ground-water contamination
7B: Wiota, rarely flooded 	85	 Potential for ground-water contamination Potential for surface-water contamination Water erosion
8B: Judson	85	 Potential for surface-water contamination Water erosion
15B: Olmitz 	35	 Potential for ground-water contamination Potential for surface-water contamination Water erosion
Ely 	30	 Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Zook 	20	Potential poor tilth and compaction Potential for ground-water contamination Restricted permeability Water erosion Water table
16: Nodaway, occasionally flooded 	55	 Flooding Potential for ground-water contamination Potential for surface-water contamination
Kennebec, occasionally flooded	35	 Flooding Potential for ground-water contamination Potential for surface-water contamination
24C2: Shelby, moderately eroded	85	 Potential for surface-water contamination Previously eroded Water erosion
24D2: Shelby, moderately eroded	70	 Potential for surface-water contamination Previously eroded Water erosion
24E: Shelby	60	 Slope Potential for surface-water contamination
24E2: Shelby, moderately eroded 	65	 Slope Potential for surface-water contamination Previously eroded Water erosion

Map symbol and soil name	Pct. of map unit	Cropland management considerations
24F: Shelby	65	 Slope Potential for surface-water contamination Water erosion
43: Bremer, rarely flooded	85	Potential poor tilth and compaction Potential for ground-water contamination Water table
45B: Zook	75	 Potential poor tilth and compaction Potential for ground-water contamination Restricted permeability Water erosion Water table
Ely	20	Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
54: Zook, occasionally flooded	90	Flooding Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
54+: Zook, occasionally flooded, overwash	80	 Flooding Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
76B: Ladoga	95	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
76C: Ladoga	75	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
76D: Ladoga	85	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion
76D2: Ladoga, moderately eroded	60	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion

Map symbol and soil name	Pct. of map unit	Cropland management considerations
86: Mt. Sterling, occasionally flooded	60	 Flooding Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
Zook, occasionally flooded, overwash	25	 Flooding Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
88: Nevin, rarely flooded	90	 Potential for ground-water contamination Water table
93D2: Shelby, moderately eroded	35	 Potential for surface-water contamination Previously eroded Water erosion
Adair, moderately eroded	25	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
93E2: Shelby, moderately eroded	45	 Slope Potential for surface-water contamination Previously eroded Water erosion
Adair, moderately eroded	30	Slope Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
172: Wabash, frequently ponded, occasionally flooded	90	Flooding Ponding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
179E: Gara	60	 Slope Potential for surface-water contamination Water erosion

Map symbol and soil name	Pct. of map unit	Cropland management considerations
179F: Gara	65	 Slope Potential for surface-water contamination Water erosion
179G: Gara	70	 Slope Potential for surface-water contamination Water erosion
192D2: Adair, moderately eroded	55	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
220: Nodaway, occasionally flooded	80	 Flooding Potential for ground-water contamination Potential for surface-water contamination
222C2: Clarinda, moderately eroded	75	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
222D: Clarinda	75	Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Water table
222D2: Clarinda, moderately eroded	70	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
222D3: Clarinda, severely eroded	70	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
248: Wabash, occasionally ponded, occasionally flooded	85	Flooding Flooding Ponding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table

Map symbol and soil name	Pct. of map unit	Cropland management considerations
269: Humeston, occasionally flooded	100	 - Flooding Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
273B: Olmitz	80	 Potential for ground-water contamination Potential for surface-water contamination Water erosion
273C: Olmitz	75	 Potential for ground-water contamination Potential for surface-water contamination Water erosion
324C2: Dickman, moderately eroded	90	Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
324D2: Dickman, moderately eroded	90	Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
354: Aquolls, ponded	100	 - Onsite investigation required
368: Macksburg 	85	
369:	100	 Potential poor tilth and compaction Potential for ground-water contamination Water table
370: Sharpsburg	95	 Potential poor tilth and compaction Potential for ground-water contamination
370B: Sharpsburg 	95	 Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water erosion

Map symbol and soil name	Pct. of map unit	Cropland management considerations
371C2: Sharpsburg, moderately eroded	35	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
Nira, moderately eroded	30	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Water table
371D2: Sharpsburg, moderately eroded	50	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
Nira, moderately eroded	20	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Water table
421C2: Gara, moderately eroded	35	 - Potential for surface-water contamination Previously eroded Water erosion
Bucknell, moderately eroded 	35	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
421D2: Gara, moderately eroded	35	 Potential for surface-water contamination Previously eroded Water erosion
Bucknell, moderately eroded	30	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
421E2: Gara, moderately eroded	40	 Slope Potential for surface-water contamination Previously eroded Water erosion

Map symbol and soil name	Pct. of map unit	Cropland management considerations
421E2: Bucknell, moderately eroded	25	Acid soil Slope Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
435: Zook, occasionally flooded	40	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
Mt. Sterling, occasionally flooded	35	 Flooding Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water table
469C2: Lamoni, moderately eroded	35	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
Clarinda, moderately eroded	30	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
Shelby, moderately eroded	20	 Potential for surface-water contamination Previously eroded Pwater erosion
469C3: Lamoni, severely eroded	35	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
Clarinda, severely eroded	30	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table

Map symbol and soil name	Pct. of map unit	Cropland management considerations
469C3: Shelby, severely eroded	20	 - Potential for surface-water contamination Previously eroded Mater erosion
470D2: Lamoni, moderately eroded	40	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
Shelby, moderately eroded	35	 Potential for surface-water contamination Previously eroded Water erosion
545B: Zook	35	Gullied Potential poor tilth and compaction Potential for ground-water contamination Restricted permeability Water erosion Water table
Ely	30	Gullied Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Gullied land	20	 Not applicable
569C: Nira 	45	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Clearfield	35	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Water erosion Water table
579E3: Bucknell, severely eroded	55	Acid soil Slope Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table

Map symbol and soil name	Pct. of map unit	Cropland management considerations
579E3: Hedrick, severely eroded	35	Slope
794C2: Armstrong, moderately eroded	65	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
Ladoga, moderately eroded	30	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
822D2: Lamoni, moderately eroded	55	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Restricted permeability Water erosion Water table
870B: Sharpsburg, terrace	85	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water erosion
870C2: Sharpsburg, terrace, moderately eroded	85	
870D2: Sharpsburg, terrace, moderately eroded	75	 Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
876B: Ladoga, terrace 	100	Acid soil Potential for ground-water contamination Potential for surface-water contamination Water erosion

Map symbol and soil name	Pct. of map unit	 Cropland management considerations
876C2: Ladoga, terrace, moderately eroded	70	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
876D2: Ladoga, terrace, moderately eroded	75	Acid soil Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
2368B: Macksburg	70	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Nira	25	Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
5030: Pits, limestone quarries	100	 Not applicable
5040: Udorthents, loamy	100	 No major considerations
5041: Udorthents, reclaimed	100	Onsite investigation required
AW: Animal waste lagoon	100	 Not applicable
SL:	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 lowa 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 yields estimates were 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
7 Wiota, rarely flooded	85 	1		198	53 	79
7B Wiota, rarely flooded	85 	2e	85 	190	51 	76
8B Judson	85 	2e	82 81	186	50 	74
15B			64	161	43	64
Olmitz	35	2e				
Ely	30	2e				
Zook	20	2w			ļ	
16 Nodaway, occasionally flooded	 	2w	86 81	191	52 	76
Kennebec, occasionally flooded	35	1				
24C2 Shelby, moderately eroded	85 	3e		153 	41 	61
24D2 Shelby, moderately eroded	70 	3e	48 48 	140 	38 	56
24E Shelby	60 	4e	40 40	129 	35 	52
24E2Shelby, moderately eroded	65 	4e		126 	34 	50
24F	65 	6e	20 21	102	28 	41
43 Bremer, rarely flooded	85 	2w	80 81	183	49 	73
45B			65	163	44	65
Zook	75	2w		100		03
Ely	20	2e		i	i	
54 Zook, occasionally flooded	90 	2w	70 70 	170 	46 	68
54+Zook, occasionally flooded, overwash	80 	2w	75 75 	176 	48 	70
76B Ladoga	95 	2e		186	50 	74

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
			I	Bu	Bu	Bu
76C Ladoga	75 75	3e	 67 	 165 	45	66
76D Ladoga	85 85	3e	 57 	 152 	41	61
76D2 Ladoga, moderately eroded	60 	3e	 52 	 145 	39	58
86			 78	180	49	 72
Mt. Sterling,			, , , , , , , , , , , , , , , , , , ,	100	40	72
occasionally floodedZook, occasionally	60	2w	і І			
flooded, overwash	25	2w				
88 Nevin, rarely flooded	90	1	 90 	 197 	53	79
93D2Shelby, moderately	İ		 33 	 120 	32	48
eroded		3e				
Adair, moderately eroded	25	4e	 	 		
93E2			23	106	29	42
Shelby, moderately						
eroded	45	4e				
Adair, moderately eroded	30	6e	l I	 		
172 Wabash, frequently ponded, occasionally flooded	90 	3w	45 	136 	37	54
179E Gara	60	6e	 35 	 122 	33	49
179FGara	65 65	6e	 15 	 95 	26	 38
179GGara	70 70	7e	 5 	 82 	22	33
192D2Adair, moderately eroded		4e	 15 	 95 	26	 38
220 Nodaway, occasionally flooded	80 	2w	 85 	 190 	51	76
222C2Clarinda, moderately eroded	75 75	4w	 25 	 109 	29	44
222D Clarinda	75 75	4w	 15 	 95 	26	38
222D2 Clarinda, moderately eroded	70 70 	4 e	 10 	 89 	24	36

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
222D3 Clarinda, severely eroded	70 70 	6e	 5 	82 	 22 	 33
248 Wabash, occasionally ponded, occasionally flooded	 85 	3w	60 	156	42 	62
269 Humeston, occasionally flooded	 100 	3w	 58 	153	 41 	 61
273BOlmitz	 80 	2e	 72 	172	46 	69
273COlmitz	75 75	3e	57 	152	41	61
324C2 Dickman, moderately eroded	90	3e	 38 	126	 34 	50
324D2 Dickman, moderately eroded	 90 	4 e	 28 	113	 31 	 45
354Aquolls, ponded	 100 	5w	 5 	82	 22 	33
368 Macksburg	 85 	1	95 	203	 55 	 81
369 Winterset	 100 	2w	 87 	192	 52 	 77
370 Sharpsburg	 95 	1	 92 	199	 54 	 80
370B Sharpsburg	 95 	2e	 87 	192	 52 	 77
371C2Sharpsburg, moderately erodedNira, moderately eroded	 35 30	3e 3e	 64 	161	43 	 64
371D2Sharpsburg, moderately			 54 	148	 40	59
eroded Nira, moderately eroded	50 20	3e 3e	 		 	
421C2Gara, moderately eroded Bucknell, moderately	 35 	3e	38 	126	34 	50
eroded	35	3e				
421D2	 		 28	113	 31	 45
Gara, moderately eroded Bucknell, moderately	 35 	4e	 			
eroded	30 	4e	 		 	

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
		<u> </u>	racing	Bu	Bu	Bu
İ				İ	İ	
421E2		_	18	99	27	40
Gara, moderately eroded	40	6e				
Bucknell, moderately	0.5					
eroded	25	6e	l I	 		
435			 75	 176	48	 70
Zook, occasionally						
flooded	40	2w				
Mt. Sterling,			İ	<u> </u>		
occasionally flooded	35	2w	ĺ	İ	İ	
469C2			30	116	31	46
Lamoni, moderately						
eroded	35	3 e		 		
Clarinda, moderately eroded	30	4w	l I	 		
Shelby, moderately	30	**		 		
eroded	20	3e		! 		
				<u> </u>		
469C3			20	102	28	41
Lamoni, severely eroded	35	4 e				
Clarinda, severely						
eroded	30	6e				
Shelby, severely eroded	20	3 e				
470D2			 25	 109	29	 44
Lamoni, moderately			23	109	23	33
eroded	40	4e		! [
Shelby, moderately			İ	! 		
eroded	35	3e				
545B			52	145	39	58
Zook	35	2w				
Ely	30	2e				
Gullied land	20					
569C		 	 60	 156	42	 62
Nira	45	3e	1	1		02
Clearfield	35	3w				
		-		<u> </u>		
579E3			5	82	22	33
Bucknell, severely						
eroded	55	7e				
Hedrick, severely eroded	35	6e				
794C2			 36	 124	22	 50
Armstrong, moderately		 	36	124 	33	50
eroded	65	3e		 		
Ladoga, moderately	03	30		! [
eroded	30	3e				
				<u> </u>		
822D2	55	4e	15	95	26	38
Lamoni, moderately						
eroded						
0700	0.5		0.7			
Sharpshurg torrage	85	2e	87	192	52	77
Sharpsburg, terrace		 	I I	 		
870C2	85	 3e	 67	165	45	 66
Sharpsburg, terrace,				====		
moderately eroded			į	İ		
moderatery eroded				 		
				I		l

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

Map symbol	Pct. of	Land	Corn	Corn	Soybeans	Oats
and soil name	map unit	capability	suitability	i	i	
	i i		rating	j	j	
				Bu	Bu	Bu
370D2 Sharpsburg, terrace, moderately eroded	75 75 	3e	62	159	43 	64
B76B Ladoga, terrace	100 	2e	82 81	186	50 	74
B76C2 Ladoga, terrace, moderately eroded	70 70	3e	62	159	43 	64
876D2 Ladoga, terrace, moderately eroded	75 75 	3e	52 	145	39 	58
2368B Macksburg Nira	 70 25	2e 2e	90 91 	197	53 	79
5030. Pits, limestone quarries			 		 	
Udorthents, loamy	100 100				 	
5041. Udorthents, reclaimed						
AW. Animal waste lagoon						
EL. Sewage lagoon					 	
N. 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)

	1 1		1	1	I	1
Map symbol	 Pct. of	Land	 Bromegrass-	Smooth	 Kentucky	 Bromegrass-
and soil name	map unit		alfalfa hay	bromegrass	bluegrass	alfalfa
			Tons	AUM*	AUM*	AUM*
7	 85	1	6.2	5.9	3.5	7.4
•	65	1	0.2] 5.9	3.3	/ - 4
Wiota, rarely flooded	 			 	 	
7B	85	2e	6.1	5.8	3.4	7.2
Wiota, rarely flooded						
8B		2e	6.0	5.3	3.1	7.1
Judson				İ	İ	
158			5.6	5.7		6.1
Olmitz	 35	2e] 5.6] 5./	3.4	6.1
Ely		2e 2e	I I	l I	l I	I
Zook	20	2w	1	 	 	l I
200	-0			İ	İ	
16			5.9	5.6	3.3	7.0
Nodaway, occasionally		2				
flooded	55	2w		l I	 	
Kennebec, occasionally flooded	 35	1	1	 	 	
		_	İ			
24C2	85	3e	5.0	4.7	2.8	5.9
Shelby, moderately						
eroded						
24D2	 70	3e	4.2	4.0	1 2.4	5.0
Shelby, moderately	1				i	
eroded	i i		İ			İ
	į į		İ	ĺ	ĺ	İ
24E	60	4e	4.2	4.0	2.3	5.0
Shelby	 		I I	 	l I	1
24E2	65	4e	3.5	3.3	2.0	4.2
Shelby, moderately	į į		İ		ĺ	İ
eroded						
24F	 65	6e	3.8	 3.6	 2.1	4.5
Shelby						
40		•				
A3	85	2w	3.6	5.0	2.9	6.2
Bremer, rarely flooded	 			 	 	
45B	į į		3.7	5.0	2.9	6.3
Zook	75	2w				
Ely	20	2e				
54	 90	2w	3.6	5.0	 2.9	6.2
Zook, occasionally	, 50 , 					
flooded	i i		İ	İ		İ
	ļ į		!	ļ	!	!
54+	80	2w	3.8	5.2	3.0	6.5
Zook, occasionally						
flooded, overwash			1	 	 	
76B	 95	2e	5.8	5.6	3.3	7.0
Ladoga	į i		İ	į	İ	İ
	l İ					

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth bromegrass	Kentucky bluegrass	Bromegrass-
			Tons	AUM*	AUM*	AUM*
76C Ladoga	75	3e	 5.5 	 5.2 	 3.1 	6.5
76D Ladoga	85	3e	5.2	5.0	2.9 	6.2
76D2 Ladoga, moderately eroded	60	3e	4.6 	4.4 	 2.6 	5.5
86 Mt. Sterling,			3.7	 5.1 	3.0	6.4
occasionally flooded	İ	2w		 	 	
flooded, overwash	25	2w] 	 		
88 Nevin, rarely flooded	90	1	5.6	5.8	3.4	7.3
93D2 Shelby, moderately eroded	35	3e	3.7	 3.6 	 2.1 	4.5
Adair, moderately eroded		4e	 	 	 	
93E2Shelby, moderately	45	4 e	3.2	3.1	1.8	3.9
Adair, moderately eroded	30	6e	į			į
172 Wabash, frequently ponded, occasionally flooded	90	3w	 	 	 	
179E Gara	60	6e	3.6	 3.5 	2.0	4.3
179F Gara	65	6e	3.1	 3.0 	 1.8 	3.7
179G Gara	70	7e	2.6	 2.4 	1.4	3.0
192D2Adair, moderately eroded	55	4e	3.2	 3.3 	2.0	4.2
220 Nodaway, occasionally flooded	80	2w	 5.9 	 5.6 	 3.3 	7.0
222C2Clarinda, moderately eroded	75	4w	 2.3 	3.2 	 1.9 	4.0
222D Clarinda	75	4w	2.5	 3.4 	2.0	4.3
222D2Clarinda, moderately eroded	70	4 e	2.0	 2.8 	 1.6 	3.5

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth bromegrass	Kentucky bluegrass	Bromegrass-
			Tons	AUM*	AUM*	AUM*
222D3 Clarinda, severely eroded	70	6e	 1.5 	 2.1 	 1.2 	2.6
248 Wabash, occasionally ponded, occasionally flooded	85	3w	 	 	 	
269 Humeston, occasionally flooded	100	3w	3.0 	 4.2 	2.4 	5.2
273B	80	2e	5.4	5.3	3.1	6.6
273COlmitz	75	3e	 5.4 	 5.1 	3.0	6.4
324C2 Dickman, moderately eroded	90	3e	 3.7 	 3.5 	 2.1 	4.4
324D2 Dickman, moderately eroded	90	4e	3.3	 3.2 	 1.9 	3.9
354Aquolls, ponded	100	5w	 	 	 	
368 Macksburg	85	1	6.0	6.3	3.7	7.8
369 Winterset	100	2w	 4.3 	 5.9 	3.5	7.4
370 Sharpsburg	95	1	6.4	 6.1 	3.6	7.6
370B Sharpsburg	95	2e	6.2	 5.9 	3.5	7.4
371C2Sharpsburg, moderately	 35	3e	 5.7 	 5.5 	 3.2 	6.8
Nira, moderately eroded	30	3e	İ			
371D2 Sharpsburg, moderately eroded	50	3e	 5.3 	 5.0 	 3.0 	6.3
Nira, moderately eroded	20	3e	 	 	 	
421C2Gara, moderately eroded Bucknell, moderately	35	3e	3.7	3.5 	2.1	4.4
eroded	35	3e	1			

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-	Smooth bromegrass	Kentucky bluegrass	Bromegrass-
			Tons	AUM*	AUM*	AUM*
421D2			3.3	 3.2	1.9	4.0
Gara, moderately eroded	35	4e			ĺ	
Bucknell, moderately	İ		İ	j	İ	İ
eroded	30	4e	İ	İ	į	į
421E2			2.6	 2.5	1.5	3.1
Gara, moderately eroded	40	6e		, 	1	
Bucknell, moderately				İ	i	
eroded	25	6e	İ	İ	İ	İ
435			3.7	 5.0	3.0	6.3
Zook, occasionally			3.7] 3.0	3.0	0.3
flooded	40	2w		! 	İ	
Mt. Sterling,				i I	İ	
occasionally flooded	35	2w	İ	İ	Ì	i
469C2			3.5	3.6	2.1	4.5
Lamoni, moderately] 3.5] 3.6	2.1	1 4.5
eroded	35	3e		 	 	
Clarinda, moderately		30		 	 	
eroded	30	4w	İ	İ	İ	
Shelby, moderately	i		İ	İ	İ	İ
eroded	20	3e	į	į	į	į
469C3			2.8	 2.9	1.7	3.7
Lamoni, severely eroded	35	4e				
Clarinda, severely			İ	İ	İ	
eroded	30	6e	İ	İ	İ	İ
Shelby, severely eroded	20	3e		ļ	ļ	į
470D2			3.3	 3.4	2.0	4.3
Lamoni, moderately	i		İ	İ	į	İ
eroded	40	4e	İ	ĺ	ĺ	
Shelby, moderately						
eroded	35	3e				
545B			4.9	4.7	2.8	5.9
Zook	35	2w	į	j	İ	İ
Ely	30	2e				
Gullied land	20					
569C			5.3	 5.0	2.9	6.3
Nira	45	3e	į	j	İ	İ
Clearfield	35	3w			ļ	ļ
579E3			2.0	2.1	1.2	2.7
Bucknell, severely				 		
eroded	55	7e	İ	İ	İ	İ
Hedrick, severely eroded	35	6e	İ	İ	ĺ	į
794C2			3.5	 3.6	2.1	4.6
Armstrong, moderately					i	
eroded	65	3e	i	İ	İ	i
Ladoga, moderately			İ	İ	İ	i
eroded	30	3e				1
822D2	55	4e	3.1	 3.3	1.9	4.1
Lamoni, moderately				, J.5		
eroded			İ	İ	į	i
i			İ	İ	İ	İ

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of	Land capability	Bromegrass-	Smooth bromegrass	 Kentucky bluegrass	Bromegrass-
			Tons	AUM*	AUM*	AUM*
870B Sharpsburg, terrace	85 	2e	 6.3 	 6.0 	 3.5 	7.5
B70C2 Sharpsburg, terrace, moderately eroded	85	3e	5.8 	 5.5 	3.2 	6.9
370D2 Sharpsburg, terrace, moderately eroded	75 	3e	5.3 	 5.1 	3.0	6.4
B76B Ladoga, terrace	100	2e	 5.9 	 5.6 	 3.3 	7.0
876C2 Ladoga, terrace, moderately eroded	70 	3e	 5.2 	 5.0 	 2.9 	6.2
876D2 Ladoga, terrace, moderately eroded	75 	3e	 4.9 	 4. 7 	 2.8 	5.9
2368B Macksburg Nira	70 25	2e 2e	5.7 	6.0 	3.5	7.5
5030. Pits, limestone quarries			 	 	 	
5040. Udorthents, loamy			 			
5041. Udorthents, reclaimed			 	 	 	
AW. Animal waste lagoon			 	 	 	
SL. Sewage lagoon			 	 	 	
N. Water			 	 	 	

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

Prime Farmland and Other Important Farmland

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

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

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

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

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

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

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

Prime Farmland and Other Important Farmland

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

Map symbol	Map unit name	Farmland classification
	 Wiota silty clay loam, 0 to 2 percent slopes, rarely flooded	 Prime farmland
В	Wiota silty clay loam, 2 to 5 percent slopes, rarely	Prime farmland
В	Judson silty clay loam, 2 to 5 percent slopes	Prime farmland
5B	Olmitz-Ely-Zook complex, 2 to 5 percent slopes	Prime farmland where drained
5	Nodaway-Kennebec complex, 0 to 2 percent slopes, occasionally flooded	Prime farmland
4C2	Shelby clay loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
D2	Shelby clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
E	Shelby clay loam, 14 to 18 percent slopes	Farmland of statewide importance
E2	Shelby clay loam, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
3	Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland where drained
5B	Zook-Ely complex, 2 to 5 percent slopes	Prime farmland where drained
<u>l</u>	Zook silty clay loam, 0 to 2 percent slopes, occasionally	Prime farmland where drained
	flooded	
1+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland where drained
6B	Ladoga silt loam, 2 to 5 percent slopes	Prime farmland
5C	Ladoga silt loam, 5 to 9 percent slopes	Farmland of statewide importance
D	Ladoga silt loam, 9 to 14 percent slopes	Farmland of statewide importance
D2	Ladoga silt loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
5	Mt. Sterling-Zook, overwash, complex, 0 to 2 percent	Prime farmland where drained and either
	slopes, occasionally flooded	protected from flooding or not frequently flooded during the growing season
3	Nevin silt loam, 0 to 2 percent slopes, rarely flooded	Prime farmland
D2	Shelby-Adair complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
3E2	Shelby-Adair complex, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
72	Wabash silty clay, frequently ponded, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
79E	Gara loam, 14 to 18 percent slopes	Farmland of statewide importance
92D2 20	Adair clay loam, 9 to 14 percent slopes, moderately eroded Nodaway silt loam, 0 to 2 percent slopes, occasionally	Farmland of statewide importance Prime farmland
22C2	flooded Clarinda silty clay loam, 5 to 9 percent slopes, moderately	 Farmland of statewide importance
22D	eroded Clarinda silty clay loam, 9 to 14 percent slopes	 Farmland of statewide importance
2D2	Clarinda silty clay loam, 9 to 14 percent slopes,	Farmland of statewide importance
:8	Wabash silty clay loam, occasionally ponded, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
59	Humeston silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
3B	Olmitz loam, 2 to 5 percent slopes	Prime farmland
3C	Olmitz loam, 5 to 9 percent slopes	Farmland of statewide importance
4C2	Dickman fine sandy loam, loamy substratum, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
24D2	Dickman fine sandy loam, loamy substratum, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
8	Macksburg silty clay loam, 0 to 2 percent slopes	Prime farmland
59	Winterset silty clay loam, 0 to 2 percent slopes	Prime farmland where drained

Prime Farmland and Other Important Farmland--Continued

Map symbol	Map unit name	Farmland classification
370B	 Sharpsburg silty clay loam, 2 to 5 percent slopes	 Prime farmland
371C2	Sharpsburg-Nira complex, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
121D2	Gara-Bucknell complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
121E2	Gara-Bucknell complex, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
135	Zook-Mt. Sterling complex, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
169C2	Lamoni-Clarinda-Shelby complex, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
170D2	Lamoni-Shelby complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
569C	Nira-Clearfield complex, 5 to 9 percent slopes	Farmland of statewide importance
794C2	Armstrong-Ladoga complex, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
322D2	Lamoni silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
370B	Sharpsburg silty clay loam, terrace, 1 to 5 percent slopes	Prime farmland
370C2	Sharpsburg silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
370D2	Sharpsburg silty clay loam, terrace, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
376B	Ladoga silt loam, terrace, 1 to 5 percent slopes	Prime farmland
376C2	Ladoga silt loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
376D2	Ladoga silt loam, terrace, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
2368B	Macksburg-Nira complex, 2 to 5 percent slopes	Prime farmland

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. Foodprocessing 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	manure and food processing wast	l-	Application of sewage sludg	re	Disposal of wastewater by irrigation	ı
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7: Wiota, rarely flooded	 85 	 Somewhat limited Too acid	 0.03	 Somewhat limited Flooding Too acid	 0.40 0.14	 Somewhat limited Too acid	 0.14
7B: Wiota, rarely flooded	 85 	 Somewhat limited Too acid 	 0.03 	 Somewhat limited Flooding Too acid 	 0.40 0.14	 Somewhat limited Too acid Too steep for surface application	 0.14 0.08
8B: Judson	 85 	 Not limited 		 Not limited 		 Somewhat limited Too steep for surface application	 0.08
15B: Olmitz	 35 	 Not limited 		 Not limited 		Somewhat limited Too steep for surface application	0.08
Ely	 30 	 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) Too steep for surface application	 1.00 0.08
Zook	 20 	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Leaching	 1.00 1.00 0.50	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
16: Nodaway, occasionally flooded Kennebec, occasionally	 55 	 Somewhat limited Flooding 	 0.60	 Very limited Flooding 	 1.00	 Somewhat limited Flooding	 0.60
flooded	35	Somewhat limited Flooding	0.60	 Very limited Flooding	1.00	 Somewhat limited Flooding	0.60

Map symbol and soil name	Pct. of map unit	manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	<u>i</u> <u>I</u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
24C2: Shelby, moderately eroded	 85 	 Somewhat limited Slow water movement Too acid	 0.64 0.02	 - Somewhat limited Slow water movement Too acid	 0.50 0.07	 - Somewhat limited Too steep for surface application	 0.92
	 	 	 	 	 	Slow water movement Too acid	0.50
24D2: Shelby, moderately eroded	 70	 Somewhat limited	 	 Somewhat limited	 	 Very limited	
		Slow water movement Slope Too acid	0.64	Slope Slow water movement Too acid	0.63	Too steep for surface application Too steep for	1.00
	 	 - - 	 	 	 	sprinkler application Slow water movement	 0.50
24E: Shelby	 60 	 Very limited Slope Slow water movement Too acid	 1.00 0.64 0.02 	 Very limited Slope Slow water movement Too acid	 1.00 0.50 0.07 	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	 1.00 1.00 0.50
24E2: Shelby, moderately	 	 - -	 	 	 	 	
eroded	65 	Very limited Slope Slow water movement	 1.00 0.64 	Very limited Slope Slow water movement	 1.00 0.50 	Very limited Too steep for surface application	 1.00
	 	Too acid 	0.02 	Too acid 	0.07 	Too steep for sprinkler application Slow water movement	1.00 0.50
24F: Shelby	 65 	 Very limited Slope Slow water movement Too acid	 1.00 0.64 0.02	 Very limited Slope Slow water movement Too acid	 1.00 0.50 0.07	Very limited Too steep for sprinkler application Too steep for surface	 1.00 1.00
	 	 	 	 	 	application Slow water movement	0.50

Map symbol and soil name	Pct. of map unit	manure and food processing wast		Application of sewage sludg	e	Disposal of wastewater by irrigation	1
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
43: Bremer, rarely flooded	 85	· -		 Very limited		 Very limited	
	 	Depth to saturated zone (Nov-Jul) Slow water	1.00 0.30	Depth to saturated zone (Nov-Jul) Flooding	1.00 0.40	Depth to saturated zone (Nov-Jul) Slow water	1.00 0.22
	 	movement		Slow water movement	0.22	movement	
45B:	İ		i	j	į	j	į
Zook	75 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00
	 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	Leaching -	0.50	 	 	Too steep for surface application	0.08
Ely	 20 	Depth to saturated zone	1.00	 Very limited Depth to saturated zone	1.00	 Very limited Depth to saturated zone	1.00
	 	(Nov-Jul) 	 	(Nov-Jul) 	 	(Nov-Jul) Too steep for surface application	0.08
54: Zook, occasionally flooded	 90	 Very limited	 	 Very limited	 	 Very limited	
1100000		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
54+: Zook, occasionally							
flooded, overwash	80 	Slow water movement	1.00	Very limited Slow water movement	1.00	movement	1.00
	 	Depth to saturated zone Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
76B:	 	Flooding 	0.60	Flooding 	1.00	Flooding 	0.60
Ladoga	95 	Somewhat limited Slow water movement	 0.30 	Somewhat limited Slow water movement	0.22	Somewhat limited Slow water movement	0.22
	 		 			Too steep for surface application	0.08

Map symbol and soil name	Pct. of map unit	manure and food processing wast	-	Application of sewage sludg 	e	Disposal of wastewater by irrigation	ı
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
76C: Ladoga	 75 	 Somewhat limited Slow water movement 	 0.30 	 Somewhat limited Slow water movement 	 0.22 	Somewhat limited Too steep for surface application Slow water movement Too steep for sprinkler application	 0.92 0.22 0.02
76D: Ladoga 	 85 	 Somewhat limited Slope Slow water movement	 0.63 0.30	 Somewhat limited Slope Slow water movement	 0.63 0.22	 Very limited Too steep for surface application	 1.00
	 		 	 	 	Too steep for sprinkler application Slow water movement	0.78 0.22
76D2: Ladoga, moderately eroded	 60 	 Somewhat limited Slope Slow water movement	 0.63 0.30 	 Somewhat limited Slope Slow water movement	 0.63 0.22 	Very limited Too steep for surface application Too steep for sprinkler application Slow water movement	
86: Mt. Sterling, occasionally	 	 	 	 	 	 	
flooded	60 	Very limited Slow water movement Depth to	 1.00 1.00	Very limited Slow water movement Depth to	 1.00 1.00	Very limited Slow water movement Depth to	 1.00 1.00
	 	saturated zone (Nov-Jul) Flooding	 0.60	saturated zone (Nov-Jul) Flooding 	 1.00	saturated zone (Nov-Jul) Flooding 	 0.60
Zook, occasionally flooded, overwash	 25 	 Very limited Slow water movement	 1.00	 Very limited Slow water movement	 1.00	 Very limited Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul) Flooding	1.00	Depth to saturated zone (Nov-Jul) Flooding	1.00 1.00	Depth to saturated zone (Nov-Jul) Flooding	1.00

Map symbol and soil name	Pct. of map unit	manure and food processing wast	-	Application of sewage sludg 	e	Disposal of wastewater by irrigation	
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88: Nevin, rarely flooded	 90	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00
	 	saturated zone (Nov-Jul) 		saturated zone (Nov-Jul) Flooding	 0.40	saturated zone (Nov-Jul) 	
93D2: Shelby, moderately	<u> </u>						
eroded	35 	Somewhat limited Slow water movement Slope	 0.64 0.63	Somewhat limited Slope Slow water movement	 0.63 0.50	Very limited Too steep for surface application	 1.00
	 	Too acid 	0.02 	Too acid 	0.07 	Too steep for sprinkler application Slow water movement	0.78 0.50
Adair, moderately	 25	 Very limited		 Very limited		 Very limited	
croucu	23	Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
	 	Slope 	0.63	Slope 	0.63	Too steep for surface application	1.00
93E2: Shelby, moderately							
eroded	45 	Very limited Slope Slow water movement	 1.00 0.64	Very limited Slope Slow water movement	 1.00 0.50	Very limited Too steep for surface application	1.00
	 	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	1.00
		 	 	 		Slow water movement	0.50
Adair, moderately eroded	 30	 Very limited	 	 Very limited	 	 Very limited	
	<u> </u>	Slow water movement	1.00	movement	1.00	movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	Slope 	1.00 	Slope 	1.00 	Too steep for surface application	1.00

Map symbol and soil name	Pct. of map	Application of manure and food processing wast	-	Application of sewage sludg	e	Disposal of wastewater by irrigation	
	unit	Rating class and	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
					i		<u> </u>
172: Wabash, frequently ponded, occasionally	 	 	 	 	 	 	
flooded	90	Slow water	1.00	Very limited Slow water	1.00	 Very limited Slow water	1.00
	 	movement Depth to saturated zone (Nov-Jul)	 1.00 	movement Depth to saturated zone (Nov-Jul)	1.00	movement Depth to saturated zone (Nov-Jul)	1.00
	İ	Ponding	1.00	Flooding	1.00	Ponding	1.00
179E: Gara	 60	 Very limited	 	 Very limited	 	 Very limited	
	 	Slope Slow water movement	1.00 0.64 	Slope Slow water movement	1.00 0.50 	Too steep for surface application Too steep for sprinkler	1.00 1.00
	 		 	 	 	application Slow water movement	0.50
179F: Gara	 65 	 Very limited Slope Slow water movement	 1.00 0.64	 Very limited Slope Slow water movement	 1.00 0.50	 Very limited Too steep for sprinkler application	 1.00
	 		 	 	 	Too steep for surface application Slow water movement	1.00 0.50
179G: Gara	 70	 Very limited	 	 Very limited		 Very limited	
	 	Slope Slow water movement	1.00 0.64 	Slope Slow water movement	1.00 0.50 	Too steep for sprinkler application	1.00
	 	 - 	 	 	 	Too steep for surface application	1.00
				 		Slow water movement	0.50
192D2: Adair, moderately	 	 	 			 	
eroded	55 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00
	 	Depth to saturated zone (Nov-Jul)	1.00	Strongly contrasting textural	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	Strongly contrasting textural stratification	1.00	stratification Depth to saturated zone (Nov-Jul)	1.00	Too steep for surface application	1.00

Map symbol and soil name	Pct. of map unit	manure and food processing wast		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
220: Nodaway, occasionally	 	 	 	 	 	 	
flooded	80 	Somewhat limited Flooding 	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
222C2: Clarinda, moderately				 		 	
eroded	75 	Very limited Slow water movement	1.00	movement	 1.00 	movement	1.00
	 	Depth to saturated zone (Nov-Jul) Runoff	1.00 0.40	Depth to saturated zone (Nov-Jul) Too acid	1.00 0.07	Depth to saturated zone (Nov-Jul) Too steep for	1.00 0.92
	 					surface application	
222D: Clarinda	 75 	 Very limited Slow water	1.00	 Very limited Slow water	 1.00	 Very limited Slow water	 1.00
	 	movement Depth to saturated zone (Nov-Jul)	 1.00 	movement Depth to saturated zone (Nov-Jul)	 1.00 	movement Depth to saturated zone (Nov-Jul)	1.00
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
222D2: Clarinda, moderately	 	 	 	 		 	
eroded	:	 Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00
	 	movement Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	Slope	0.63	Slope	0.63	Too steep for surface application	1.00
222D3: Clarinda, severely	 	 	 	 	 	 	
eroded	70 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00
	 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	Slope 	0.63	Slope 	0.63	Too steep for surface application	1.00

Map symbol and soil name	Pct. of map unit	Application of manure and food processing wast	-	Application of sewage sludg	e	Disposal of wastewater by irrigation	
	i I	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
248: Wabash, occasionally ponded, occasionally		 	 	 	 	 	
flooded	85 	 Very limited Slow water movement	1.00	Very limited Slow water movement	 1.00 	 Very limited Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
269:	 	Ponding 	1.00 	Flooding 	1.00 	Ponding 	1.00
Humeston, occasionally flooded	 100	 Very limited		 Very limited	 	 Very limited	
		Slow water movement	1.00	movement	1.00	movement	1.00
	 	Depth to saturated zone Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
		Flooding 	0.60	Flooding 	1.00	Flooding 	0.60
273B: Olmitz	 80 	 Not limited 	 	 Not limited 	 	 Somewhat limited Too steep for surface application	 0.08
273C: Olmitz	 75 	 Not limited 	 	 Not limited 	 	 Somewhat limited Too steep for surface	0.92
		 - 	 	 - -	 	application Too steep for sprinkler application	0.02
324C2: Dickman, moderately eroded	 an	 Very limited		 Very limited	 	 Very limited	
eroded		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	 	Leaching 	0.45	 	 	Too steep for surface application	0.92
	 	 		 		Too steep for sprinkler application	0.02

Map symbol and soil name	Pct. of map unit	manure and food processing wast		Application of sewage sludg	re	Disposal of wastewater by irrigation	
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
324D2: Dickman, moderately						 	
eroded	90	Very limited Filtering capacity	1.00	Very limited Filtering	1.00	Very limited Filtering capacity	1.00
	 	Slope Leaching	0.63	capacity Slope 	0.63	Too steep for surface	1.00
	 	 	 	 	 	application Too steep for sprinkler application	 0.78
354: Aquolls, ponded	100	 Not rated	<u> </u> 	 Not rated	ļ	 Not rated	
368: Macksburg	 85 	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00
	 	(Nov-Jul) Slow water movement	0.30	(Nov-Jul) Slow water movement	0.22	(Nov-Jul) Slow water movement	 0.22
369: Winterset	 100 	 Very limited Depth to saturated zone (Nov-Jul) Slow water	 1.00 0.30	 Very limited Depth to saturated zone (Nov-Jul) Slow water	 1.00 0.22	 Very limited Depth to saturated zone (Nov-Jul) Slow water	 1.00 0.22
370:	 	movement 	 	movement 		movement 	
Sharpsburg	95 	Somewhat limited Slow water movement Too acid	0.30	Somewhat limited Too acid Slow water movement	0.42	Somewhat limited Too acid Slow water movement	0.42
370B: Sharpsburg	 95 	 Somewhat limited Slow water	0.30	 Somewhat limited Too acid	0.42	 Somewhat limited Too acid	0.42
	 	movement Too acid	 0.11 	Slow water movement 	0.22 	Slow water movement Too steep for surface application	0.22 0.08
371C2: Sharpsburg, moderately eroded	 35 	 Somewhat limited Slow water movement	 0.30	 Somewhat limited Too acid Slow water	 0.42 0.22	 Somewhat limited Too steep for surface	 0.92
	 	Too acid	0.11	movement 	 	application Too acid Slow water movement	0.42

Map symbol and soil name	Pct. of map unit	manure and food processing wast		Application of sewage sludg	e	Disposal of wastewater by irrigation	1
	<u> </u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
371C2: Nira, moderately eroded	 30 	Very limited Depth to saturated zone (Nov-Jul)	 1.00	Very limited Depth to saturated zone (Nov-Jul)	 1.00	 	 1.00 0.92
	 				 	surface application Too steep for sprinkler application	0.02
371D2: Sharpsburg,							
moderately eroded	50 	Somewhat limited Slope Slow water movement Too acid	 0.63 0.30 0.11	Somewhat limited Slope Too acid Slow water movement	0.63 0.42 0.22	Very limited Too steep for surface application Too steep for	 1.00 0.78
	 	100 acid 				sprinkler application Too acid	0.78
Nira, moderately eroded	 20 	 Very limited Depth to saturated zone (Nov-Jul)	 1.00 	 Very limited Depth to saturated zone (Nov-Jul)	 1.00 	 Very limited Too steep for surface application	1.00
	 	Slope 	0.63 	Slope 	0.63 	Depth to saturated zone (Nov-Jul) Too steep for sprinkler application	1.00 0.78
421C2: Gara, moderately eroded	 35	 Somewhat limited Slow water	 0.64	 Somewhat limited Slow water	 0.50	 Somewhat limited Too steep for	 0.92
	 	movement 		movement 		surface application Slow water movement	 0.50
	 	 	 	 	 	Too steep for sprinkler application	0.02
Bucknell, moderately eroded		 Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00
		movement Depth to saturated zone (Nov-Jul)	1.00		1.00	movement Depth to saturated zone (Nov-Jul)	1.00
	 	Runoff	0.40	Too acid	0.55	Too steep for surface application	0.92

Map symbol and soil name	Pct. of map	Application of manure and food processing wast	-	Application of sewage sludg	e	Disposal of wastewater by irrigation	ı
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
421D2: Gara, moderately eroded	 35	 Somewhat limited Slow water	 0.64	 Somewhat limited Slope	 0.63	 Very limited Too steep for	 1.00
	 	movement Slope	 0.63 	Slow water movement	0.50	surface application Too steep for sprinkler	0.78
		 		 		application Slow water movement	0.50
Bucknell, moderately		 		 	l I	 	
eroded	:	 Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00
	 	Depth to saturated zone Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
		Slope 	0.63	Slope 	0.63	Too steep for surface application	1.00
421E2:				 		 	
Gara, moderately eroded	40	 Very limited		 Very limited		 Very limited	
Croucu		Slope Slow water movement	1.00	Slope Slow water movement	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
	 		 	 	 	Slow water movement	0.50
Bucknell, moderately eroded		 Very limited		 Very limited		 Very limited	
010404	23	Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone (Nov-Jul)		saturated zone (Nov-Jul)		saturated zone (Nov-Jul)	
	 	Slope 	1.00 	Slope 	1.00 	Too steep for surface application	1.00
435: Zook, occasionally flooded	40	 Very limited		 Very limited	 	 Very limited	
2100464-3		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60

Map symbol and soil name	Pct. of map unit	Application of manure and food processing wast	-	Application of sewage sludg	e	Disposal of wastewater by irrigation	n
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
435: Mt. Sterling, occasionally	 	 	 	 	 	 	
flooded	35 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00 	Very limited Slow water movement	 1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
469C2:	 	Flooding 	0.60	Flooding 	1.00 	Flooding 	0.60
Lamoni, moderately			i		i		i
eroded	35 	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone	1.00
	 	Too acid	0.02	(NOV-UII) Too acid 	0.07	Too steep for surface application	0.92
Clarinda, moderately eroded	:	 Very limited	 	 Very limited	 	 Very limited	
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00 	Depth to saturated zone (Nov-Jul)	1.00
	 	Runoff 	0.40 	Too acid 	0.07 	Too steep for surface application	0.92
Shelby, moderately eroded	20	 Somewhat limited		 Somewhat limited	į Į	 Somewhat limited	
	 	Slow water movement Too acid	0.64	Slow water movement Too acid	0.50 0.07	Too steep for surface application	0.92
	 					Slow water movement	0.50
469C3:	 	 		 	 	Too acid 	0.07
Lamoni, severely eroded	 35 	 Very limited Slow water	 1.00	 Very limited Slow water	 1.00	 Very limited Slow water	 1.00
	 	movement Depth to saturated zone	 1.00 	movement Depth to saturated zone	 1.00 	movement Depth to saturated zone	 1.00
	 	(Nov-Jul) Too acid 	 0.02 	(Nov-Jul) Too acid 	 0.07 	(Nov-Jul) Too steep for surface application	 0.92

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
30	Slow water	 1.00	Slow water	1.00	Very limited Slow water	1.00
	Depth to saturated zone (Nov-Jul)	 1.00 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	Runoff	0.40	Too acid	0.07	Too steep for surface application	0.92
20	Somewhat limited	 	 Somewhat limited	 	 Somewhat limited	
	Slow water movement Too acid	0.64	Slow water movement Too acid	0.50	Too steep for surface application	0.92
					Slow water movement	0.50
		 	 	 	Too acid 	0.07
40	Slow water	 1.00	 Very limited Slow water	1.00	 Very limited Slow water	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
	Slope	0.63	Slope 	0.63	Too steep for surface application	1.00
2.5						
35	Slow water movement	0.64	Slope Slow water	0.63	Too steep for surface	1.00
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler	0.78
			 	 	Slow water movement	0.50
35	_	:			 Very limited	 1.00
	movement Depth to	1.00	movement Depth to	į	movement Depth to	1.00
	saturated zone (Nov-Jul) Leaching	 0.50	saturated zone (Nov-Jul) 		Nov-Jul) Too steep for	0.08
	30 20 40 35	map processing wastunit Rating class and limiting features 30 Very limited Slow water movement Depth to saturated zone (Nov-Jul) Runoff 20 Somewhat limited Slow water movement Too acid 40 Very limited Slow water movement Depth to saturated zone (Nov-Jul) Slope 35 Somewhat limited Slow water movement Slope Too acid 35 Very limited Slow water movement Slope Too acid	Main Processing waste Main Processing waste Main Patient Patie	map unit Rating class and limiting features Satistic class and limiting features	Map Processing waste	

Map symbol and soil name	Pct. of map unit	Application of manure and food processing wast		 Application of sewage sludg 	e	Disposal of wastewater by irrigation	ı
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
545B: Ely	 30 	 Very limited Depth to saturated zone (Nov-Jul) 	 1.00 	 Very limited Depth to saturated zone (Nov-Jul) 	 1.00 		 1.00 0.08
Gullied land	20	 Not rated		 Not rated		 Not rated	
569C: Nira	 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) Too steep for surface application Too steep for sprinkler application	 1.00 1 0.92 1 0.02
Clearfield	35	Slow water movement	 1.00 1.00 	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
579E3: Bucknell, severely	 	 	 	 	 	 	
eroded	55 		 1.00 1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Slope	 1.00 1.00 1.00	Very limited Slow water movement Depth to saturated zone (Nov-Jul) Too steep for surface application	 1.00 1.00 1.00
Hedrick, severely eroded	 35 	Very limited Slow water movement Slope Depth to saturated zone (Nov-Jul)	 1.00 1.00 1.00		 1.00 1.00 1.00 	Very limited Slow water movement Too steep for surface application Too steep for sprinkler application	 1.00 1.00 1.00

Map symbol and soil name	Pct. of map unit	manure and food processing wast		Application of sewage sludg	re	Disposal of wastewater by irrigation	
	<u> </u> 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
794C2: Armstrong,	 	 	 	 	 	 	
moderately eroded	65	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	 Very limited Slow water movement	1.00
	 	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	 		 		Too steep for surface application	0.92
Ladoga, moderately eroded	30	 Somewhat limited Slow water	0.30	 Somewhat limited Slow water	0.22	 Somewhat limited Too steep for	0.92
	 	movement -		movement 		surface application Slow water movement	0.22
	 	 		 	 	Too steep for sprinkler application	0.02
822D2: Lamoni, moderately		 	 	 	 	 	
eroded	55	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
	 	(NOV-ULI) Slope 	0.63	(NOV-SUI) Slope 	0.63	Too steep for surface application	1.00
870B: Sharpsburg, terrace	85	 Somewhat limited		 Somewhat limited		 Somewhat limited	
		Slow water movement Too acid	0.30	Too acid Slow water movement	0.42	Too acid Slow water movement	0.42
870C2: Sharpsburg, terrace,		 					
moderately eroded	85 	Somewhat limited Slow water movement Too acid	 0.30 0.11	Somewhat limited Too acid Slow water movement	 0.42 0.22 	Somewhat limited Too steep for surface application Too acid	 0.92 0.42
			<u> </u>		į Į	Slow water movement	0.22

Map symbol and soil name	Pct. of map unit	!	manure and food- processing waste		Application of sewage sludge		L
	<u> </u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
870D2: Sharpsburg, terrace, moderately eroded		 Somewhat limited Slope Slow water movement Too acid	 0.63 0.30 0.11	 Somewhat limited Slope Too acid Slow water movement	 0.63 0.42 0.22 	Very limited Too steep for surface application Too steep for sprinkler application Too acid	 1.00
876B: Ladoga, terrace	100	 Somewhat limited Slow water movement	 0.30 	 Somewhat limited Slow water movement	 0.22 	 Somewhat limited Slow water movement	0.22
876C2: Ladoga, terrace, moderately eroded	 70 	 Somewhat limited Slow water movement	 0.30 	 Somewhat limited Slow water movement	 0.22 	Somewhat limited Too steep for surface application Slow water movement Too steep for sprinkler	 0.92 0.22 0.02
876D2: Ladoga, terrace, moderately eroded	 75 	 Somewhat limited Slope Slow water movement	 0.63 0.30 	 Somewhat limited Slope Slow water movement	 0.63 0.22 	application	 1.00 0.78 0.22
2368B: Macksburg	 70 	 Very limited Depth to saturated zone (Nov-Jul) Slow water movement	 1.00 0.30	 Very limited Depth to saturated zone (Nov-Jul) Slow water movement	 1.00 0.22	Very limited Depth to saturated zone (Nov-Jul) Slow water movement Too steep for	 1.00 0.22 0.08
Nira	 25 	 Very limited Depth to saturated zone (Nov-Jul)	 1.00 	 Very limited Depth to saturated zone (Nov-Jul)	 1.00 	surface application Very limited Depth to saturated zone (Nov-Jul) Too steep for surface application	 1.00 0.08

Map symbol	Pct.	Application of		Application		Disposal of	
and soil name	of	manure and food	-	of sewage sludge		wastewater	
	map	processing wast	е			by irrigation	ı
	unit						
		Rating class and	Value	Rating class and	Value	Rating class and	Valu
		limiting features	L	limiting features		limiting features	
030:	 		 	 			
Pits, limestone	İ		İ	İ	İ		i
quarries	100	Not rated	İ	Not rated		Not rated	ĺ
040:	 	l		l			
Udorthents, loamy	1100	 Not rated		 Not rated		 Not rated	1
udorthents, loamy	1 100	NOT Fated 	 	NOT Fated 		NOT Fated 	
041:	İ		<u> </u>	İ	İ		İ
Udorthents,							
reclaimed	100	Not rated		Not rated		Not rated	
W:	 	 	 	 			
Animal waste lagoon	100	 Not rated	i	 Not rated	İ	Not rated	i
J	İ		i		İ		i
L:							
Sewage lagoon	100	Not rated		Not rated		Not rated	ļ
·	 	 -	 	 -			
: Water	 100	Not rated	 	 Not rated	 	 Not rated	1

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			Picnic areas		Playgrounds 	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7: Wiota, rarely flooded	 85 	 Very limited Flooding		 Not limited 		 Not limited 	
7B: Wiota, rarely flooded	 85 	 Very limited Flooding	 1.00	 Not limited 		 Somewhat limited Slope	 0.50
8B: Judson	85	 Not limited	 	 Not limited	 	 Somewhat limited Slope	0.50
15B: Olmitz	 35 	 Not limited 		 Not limited 		 Somewhat limited Slope	
Ely	 30 	 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 0.50
Zook	 20 		 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99		 1.00 0.99 0.50
16: Nodaway, occasionally flooded	 55	 Very limited Flooding	 1.00	 Not limited		 Somewhat limited Flooding	 0.60
Kennebec, occasionally flooded	 35	 Very limited Flooding	 1.00	 Not limited 		 Somewhat limited Flooding	
24C2: Shelby, moderately eroded	 85 	 Somewhat limited Slow water movement	 0.35	 	 0.35	 Very limited Slope Slow water movement	 1.00 0.35
24D2: Shelby, moderately eroded	 70 	 Somewhat limited Slope Slow water movement	0.63	 Somewhat limited Slope Slow water movement	0.63	 	 1.00 0.35

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit			Picnic areas		Playgrounds	
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
24E: Shelby	 60 	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35	Very limited Slope Slow water movement	 1.00 0.35
24F: Shelby	 65 	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35
43: Bremer, rarely flooded	 85 	 	 1.00 1.00 0.15	 	 1.00 0.15	 	 1.00 0.15
45B: Zook	 75 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	Very limited Depth to saturated zone Slow water movement Slope	 1.00 0.99
Ely	 20 	 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 0.50
54: Zook, occasionally flooded	 90 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.99 0.60
54+: Zook, occasionally flooded, overwash	 80 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	 	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.99

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit			Picnic areas		Playgrounds 	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
76B: Ladoga	 95 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slope Slow water movement	 0.50 0.15
76C: Ladoga	 75 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement	 0.15 	 Very limited Slope Slow water movement	 1.00 0.15
76D: Ladoga	 85 	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Very limited Slope Slow water movement	 1.00 0.15
76D2: Ladoga, moderately eroded	 60 	 - Somewhat limited Slope Slow water movement	 0.63 0.15	 - Somewhat limited Slope Slow water movement	 0.63 0.15	 - Very limited Slope Slow water movement	 1.00 0.15
86: Mt. Sterling, occasionally flooded	 60 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	Very limited Depth to saturated zone Slow water movement	 1.00 0.99	Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.99 0.60
Zook, occasionally flooded, overwash	 25 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.99
88: Nevin, rarely flooded	 90 	 Very limited Depth to saturated zone Flooding	 1.00 1.00	 	 1.00	 	 1.00
93D2: Shelby, moderately eroded	 35 	 Somewhat limited Slope Slow water movement	 0.63 0.35	 Somewhat limited Slope Slow water movement	 0.63 0.35	 	 1.00 0.35

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
93D2:					İ		İ
Adair, moderately	i	i I	i	İ	i	İ	i
eroded	25	 Very limited	i	 Very limited	i	 Very limited	i
		Depth to	1.00	Depth to	1.00	Depth to	1.00
	i	saturated zone		saturated zone		saturated zone	
	i	Slow water	1.00	Slow water	1.00	Slope	1.00
	i	movement		movement		Slow water	1.00
		Slope	0.63	Slope	0.63	movement	
93E2:		 		 		 	
Shelby, moderately							
eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water	0.35	Slow water	0.35	Slow water	0.35
		movement		movement		movement	
Adair, moderately		 	į			 	į
eroded	30	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Slope	1.00	Slope	1.00	Slope	1.00
	ļ	Slow water	1.00	Slow water	1.00	Slow water	1.00
		movement		movement		movement	
172: Wabash, frequently ponded, occasionally	 	 	 	 	 	 	
flooded	90	 Very limited	i	 Very limited	i	 Very limited	i
	i	Depth to	1.00	Depth to	1.00	Slow water	1.00
	i	saturated zone		saturated zone	i	movement	i
	i	Flooding	1.00	Slow water	1.00	Depth to	1.00
	i	Slow water	1.00	movement	i	saturated zone	i
	į į	movement	į	Too clayey	1.00	Too clayey	1.00
179E:							
Gara	60	Very limited		Very limited		Very limited	
	ļ	Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.35	Slow water movement	0.35	Slow water movement	0.35
179F:	 	 		 		 	
Gara	65	 Very limited		 Very limited	i	 Very limited	1
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water	0.35	Slow water	0.35	Slow water	0.35
		movement		movement		movement	
179G:		 				[1
1756.	1 70	Very limited	1	Very limited	1	Very limited	1
Gara	/0	sera iimired		very rimited	1	1.017 111111000	
	70	Slope	1.00	Slope	1.00	Slope	1.00
	70 		1.00	-	1.00		1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

and soil name	Pct. of map unit			Picnic areas		Playgrounds		
	<u> </u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
192D2: Adair, moderately eroded	 55	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	
	 	saturated zone Slow water movement Slope	1.00	saturated zone Slow water movement Slope	1.00	saturated zone Slope Slow water movement	 1.00 1.00	
220: Nodaway, occasionally flooded	 80	 Verv limited	 	 Not limited		 Somewhat limited	 	
		Flooding	1.00		İ	Flooding	0.60	
222C2: Clarinda, moderately eroded		 Very limited		 Very limited		 Very limited	 	
	 	Depth to saturated zone Slow water	1.00	Depth to saturated zone Slow water	1.00	Slow water movement Depth to	1.00	
	 	movement 	 	movement 	 	saturated zone Slope	1.00	
222D: Clarinda	 75	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	 Very limited Slow water	 1.00	
	 	saturated zone Slow water movement	1.00	saturated zone Slow water movement	1.00	movement Depth to saturated zone	1.00	
222D2:	 	Slope 	0.63	Slope 	0.63 	Slope 	1.00 	
Clarinda, moderately eroded		 Very limited Depth to	1.00	 Very limited Depth to	1.00	 Very limited Slow water	1.00	
	 	saturated zone Slow water movement Slope	 1.00 0.63	saturated zone Slow water movement Slope	 1.00 0.63	movement Depth to saturated zone Slope	 1.00 1.00	
222D3: Clarinda, severely	 			 				
eroded	70 	 Very limited Depth to saturated zone	1.00	 Very limited Depth to saturated zone	1.00	Very limited Slow water movement	1.00	
	 	Slow water movement Too clayey	1.00 1.00	Slow water movement Too clayey	1.00 1.00	Depth to saturated zone Slope	1.00 1.00	
248: Wabash, occasionally ponded,	 	 	 	 	 	 		
occasionally flooded	 85 	Depth to saturated zone		 Very limited Depth to saturated zone	1.00	 Very limited Slow water movement		
	 	Flooding Slow water movement	1.00 1.00 	Slow water movement Ponding	1.00 1.00	Depth to saturated zone Ponding	1.00	

Camp Areas, Picnic Areas, and Playgrounds--Continued

and soil name	Pct. of map unit	i !		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
269: Humeston, occasionally flooded	 100 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00	Very limited Depth to saturated zone Slow water movement	 1.00 1.00	 	 1.00 1.00 0.60
273B: Olmitz	 80 	 Not limited		 Not limited 	 	 Somewhat limited Slope	 0.50
273C: Olmitz	 75 	 Not limited 		 Not limited 	 	 Very limited Slope	
324C2: Dickman, moderately eroded	 90 	 Not limited 	 	 Not limited 	 	 Very limited Slope	 1.00
324D2: Dickman, moderately eroded	 90 	 Somewhat limited Slope	 0.63	 Somewhat limited Slope	 0.63	 Very limited Slope	
354: Aquolls, ponded	 100	 Not rated	 	 Not rated 	 	 Not rated 	
368: Macksburg	 85 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15
369: Winterset	 100 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15	saturated zone	 1.00 0.15	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15
370: Sharpsburg	 95 	 Somewhat limited Slow water movement	 0.15	 Somewhat limited Slow water movement	 0.15	 Somewhat limited Slow water movement	 0.15
370B: Sharpsburg	 95 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slope Slow water movement	 0.50 0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. Camp areas of map unit			Picnic areas 		Playgrounds 		
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
371C2: Sharpsburg, moderately eroded	 35 	 Somewhat limited Slow water movement	 0.15	 Somewhat limited Slow water movement	 0.15	 Very limited Slope Slow water movement	 1.00 0.15	
Nira, moderately eroded	 30 	 Somewhat limited Depth to saturated zone	 0.39	 Somewhat limited Depth to saturated zone	 0.19 	 Very limited Slope Depth to saturated zone	1.00	
371D2: Sharpsburg, moderately eroded	 50 	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Very limited Slope Slow water movement	 1.00 0.15	
Nira, moderately eroded	 20 	 Somewhat limited Slope Depth to saturated zone	0.63	 Somewhat limited Slope Depth to saturated zone	 0.63 0.19	 Very limited Slope Depth to saturated zone	 1.00 0.39	
421C2: Gara, moderately eroded	 35 	 Somewhat limited Slow water movement	 0.35	 - Somewhat limited Slow water movement	 0.35	 - Very limited Slope Slow water movement	 1.00 0.35	
Bucknell, moderately eroded	:	 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 		 1.00 1.00 	
421D2: Gara, moderately eroded	 35 	 Somewhat limited Slope Slow water movement	 0.63 0.35	 Somewhat limited Slope Slow water movement	 0.63 0.35	 Very limited Slope Slow water movement	 1.00 0.35	
Bucknell, moderately eroded		Very limited Depth to saturated zone Slow water movement Slope	 1.00 1.00 0.63	Very limited Depth to saturated zone Slow water movement Slope	 1.00 1.00 0.63	Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit			Picnic areas 		Playgrounds	
	İ	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421E2: Gara, moderately eroded	 40 	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35	 Very limited Slope Slow water movement	 1.00 0.35
Bucknell, moderately eroded		 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00
435: Zook, occasionally flooded	 40 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement Flooding	1.00
Mt. Sterling, occasionally flooded	 35 	 Very limited Depth to saturated zone Flooding Slow water movement	 1.00 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.99
469C2: Lamoni, moderately eroded	 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 Slope	 1.00 1.00
Clarinda, moderately eroded		 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 Slow water movement Depth to saturated zone Slope	 1.00 1.00
Shelby, moderately eroded	 20 	 Somewhat limited Slow water movement	0.35	 Somewhat limited Slow water movement	 0.35 	 Very limited Slope Slow water movement	 1.00 0.35

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit			Picnic areas		Playgrounds -		
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
469C3: Lamoni, severely eroded	 35 	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	
	 	saturated zone Slow water movement	 1.00 	saturated zone Slow water movement 	 1.00 	saturated zone Slow water movement Slope	 1.00 1.00	
Clarinda, severely eroded	 30	 Very limited	 	 Very limited	 	 Very limited	 	
	 	Depth to saturated zone Slow water movement	1.00 1.00	Depth to saturated zone Slow water movement	1.00 1.00	Slow water movement Depth to saturated zone	1.00 1.00	
	 	Too clayey	1.00	Too clayey	1.00	Slope	1.00	
Shelby, severely eroded	 20 	 Somewhat limited Slow water movement	 0.35 	 Somewhat limited Slow water movement	 0.35 	 Very limited Slope Slow water movement	 1.00 0.35	
470D2: Lamoni, moderately eroded	 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	
	 	Slow water movement Slope	1.00	Slow water movement Slope	1.00	Slope Slow water movement	1.00	
Shelby, moderately eroded	 35 	 Somewhat limited Slope Slow water movement	 0.63 0.35	 Somewhat limited Slope Slow water movement	 0.63 0.35	 Very limited Slope Slow water movement	 1.00 0.35	
545B:	 	 		 		 	l I	
Zook	35 	Very limited Depth to saturated zone Slow water	1.00	Very limited Depth to saturated zone	 1.00 0.99	Very limited Depth to saturated zone	 1.00 0.99	
	 	movement		Slow water movement		Slow water movement Slope	0.50	
Ely	 30 	 Very limited Depth to saturated zone	1	 Very limited Depth to saturated zone	 1.00 		 1.00 0.50	
Gullied land	 20 	 Not rated 	 	 Not rated 	 	 Not rated 	 	
569C: Nira	 45 	 Somewhat limited Depth to saturated zone	 0.39 	 Somewhat limited Depth to saturated zone	 0.19 	Very limited Slope Depth to saturated zone	 1.00 0.39	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit			Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
569C: Clearfield	 35 	 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 1.00
579E3: Bucknell, severely eroded	 55 	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 1.00
Hedrick, severely eroded	 35 	 Very limited Slope Depth to saturated zone	 1.00 0.39	Very limited Slope Depth to saturated zone	 1.00 0.19	 Very limited Slope Depth to saturated zone	 1.00 0.39
794C2: Armstrong, moderately eroded	 65 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slow water movement	 1.00 0.99	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 1.00 0.99
Ladoga, moderately eroded	 30 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement	 0.15 	 Very limited Slope Slow water movement	 1.00 0.15
822D2: Lamoni, moderately eroded	 55 	 Very limited Depth to saturated zone Slow water movement Slope	 1.00 1.00 0.63	 	 1.00 1.00 0.63	 	 1.00 1.00
870B: Sharpsburg, terrace	 85 	 Somewhat limited Slow water movement 	 0.15 	 Somewhat limited Slow water movement 	 0.15 	 Somewhat limited Slow water movement Slope	 0.15 0.12
870C2: Sharpsburg, terrace, moderately eroded	:	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement 	 0.15 	 Very limited Slope Slow water movement	 1.00 0.15

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
870D2: Sharpsburg, terrace, moderately eroded	:	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Somewhat limited Slope Slow water movement	 0.63 0.15	Very limited Slope Slow water movement	 1.00 0.15
876B: Ladoga, terrace	 100 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement	 0.15 	 Somewhat limited Slow water movement Slope	0.15
876C2: Ladoga, terrace, moderately eroded	 70 	 Somewhat limited Slow water movement	 0.15	 Somewhat limited Slow water movement	 0.15	 Very limited Slope Slow water movement	 1.00 0.15
876D2: Ladoga, terrace, moderately eroded	 75 	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Somewhat limited Slope Slow water movement	 0.63 0.15	 Very limited Slope Slow water movement	 1.00 0.15
2368B: Macksburg	 70 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.15	Very limited Depth to saturated zone Slow water movement	 1.00 0.15	 Very limited Depth to saturated zone Slope Slow water movement	 1.00 0.50 0.15
Nira	 25 	 Somewhat limited Depth to saturated zone	 0.39 	 Somewhat limited Depth to saturated zone	 0.19 	Somewhat limited Slope Depth to saturated zone	0.50
5030: Pits, limestone quarries	 100	 Not rated		 - Not rated		 - Not rated	
5040: Udorthents, loamy	100	 Not rated		 Not rated	 	 Not rated	
5041: Udorthents, reclaimed	 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 	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol	Pct.	Camp areas		Picnic areas		 Playgrounds	
and soil name	of	į -		İ		i	
	map	İ		İ		İ	
	unit	j		İ		İ	
		Rating class and	Value	Rating class and	Value	Rating class and	Value
	ĺ	limiting features	İ	limiting features	İ	limiting features	<u>i</u>
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		s	Off-road motorcycle trai	ls	Golf fairways 	3
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7: Wiota, rarely flooded	 85	 Not limited	 	 Not limited 		 Not limited 	
7B: Wiota, rarely flooded	 85	 Not limited	 	 Not limited	 	 Not limited	
8B: Judson	85	 Not limited	 	 Not limited	į Į	 Not limited	İ
15B: Olmitz	 35	 Not limited		 Not limited		 Not limited	
Ely	30 	 Very limited Depth to saturated zone	1.00	 Very limited Depth to saturated zone		 Very limited Depth to saturated zone	1.00
Zook	 20 	 Very limited Depth to saturated zone	1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00
16: Nodaway, occasionally flooded	 55 	 Not limited	 	 Not limited		 Somewhat limited Flooding	
Kennebec, occasionally flooded	 35	 Not limited 	 	 Not limited		 Somewhat limited Flooding	
24C2: Shelby, moderately eroded	 85	 Not limited 	 	 Not limited 		 Not limited 	
24D2: Shelby, moderately eroded	 70 	 Not limited 	 	 Not limited 	 	 Somewhat limited Slope	 0.63
24E: Shelby	 60 	 Somewhat limited Slope 	 0.02	 Not limited 		 Very limited Slope	 1.00
24E2: Shelby, moderately eroded	 65 	 Somewhat limited Slope		 Not limited 		 Very limited Slope	 1.00
24F: Shelby	 65 	 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		s	Off-road motorcycle trails		Golf fairways 	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
43: Bremer, rarely flooded	 85 	Very limited Depth to saturated zone	 1.00	Very limited Depth to saturated zone	 1.00	Very limited Depth to saturated zone	 1.00
45B: Zook	 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
Ely	 20 	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	1.00
54: Zook, 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
54+: Zook, occasionally flooded, overwash	 80 	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
76B: Ladoga	 95	 Not limited 		 Not limited 		 Not limited 	
76C: Ladoga	 75 	 Not limited 		 Not limited 		 Not limited 	
76D: Ladoga	 85 	 Very limited Water erosion	1.00	 Very limited Water erosion	1.00	 Somewhat limited Slope	0.63
76D2: Ladoga, moderately eroded	 60	 Very limited Water erosion	 1.00	 Very limited Water erosion		 Somewhat limited Slope	0.63
86: Mt. Sterling, occasionally flooded	 60 	 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
Zook, occasionally flooded, overwash	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

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trail	s	Off-road motorcycle trai	ls	Golf fairways 	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
88: Nevin, rarely flooded	 90 	 Very limited Depth to saturated zone	 1.00	Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	
93D2: Shelby, moderately eroded	 35	 Not limited	 	 Not limited	 	 Somewhat limited Slope	0.63
Adair, moderately eroded	 25 	 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 0.63
93E2: Shelby, moderately eroded	 45 	 Somewhat limited Slope	 0.02	 Not limited 	 	 - Very limited Slope	 1.00
Adair, moderately eroded	 30 	 Very limited Depth to saturated zone Slope	 1.00 0.02	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone Slope	 1.00 1.00
172: Wabash, frequently ponded, occasionally flooded	 90 	 	 1.00 1.00	 	 1.00 1.00	Very limited Depth to saturated zone Too clayey Ponding	 1.00 1.00
179E: Gara	 60 	 Somewhat limited Slope	 0.02	 Not limited 		 Very limited Slope	
179F: Gara	 65 	 Somewhat limited Slope	 0.82	 Not limited 		 Very limited Slope	1.00
179G: Gara	 70 	 Very limited Slope	 1.00	 Somewhat limited Slope 	 0.56	 Very limited Slope 	1.00
192D2: Adair, moderately eroded	 55 	 Very limited Depth to saturated zone	 1.00 	 	 1.00 	 	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	 Pct. of map unit		s	Off-road motorcycle trai 	ls	 Golf fairways 	
	unit	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220: Nodaway, occasionally flooded	 80 	 Not limited 	 	 Not limited 	 	 Somewhat limited Flooding	 0.60
222C2: Clarinda, moderately eroded		 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	1.00
222D: Clarinda	 75 	 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 0.63
222D2: Clarinda, moderately eroded		Very limited Depth to saturated zone Water erosion	 1.00 1.00	 Very limited Depth to saturated zone Water erosion	 1.00 1.00	Very limited Depth to saturated zone	 1.00 0.63
222D3: Clarinda, severely eroded	 70 	 - Very limited Depth to saturated zone Too clayey	 1.00 1.00	 	 1.00 1.00	 - Very limited Depth to saturated zone Too clayey Slope	 1.00 1.00 0.63
248: Wabash, occasionally ponded, occasionally flooded	 	 - Very limited Depth to saturated zone Ponding	 1.00 1.00	 	 1.00 1.00	 	 1.00 1.00
269: Humeston, occasionally flooded	 100 	: -	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone Flooding	 1.00 0.60
273B: Olmitz	 80 	 Not limited 	 	 Not limited 		 Not limited 	
273C: Olmitz	 75 	 Not limited 	 	 Not limited 		 Not limited	
324C2: Dickman, moderately eroded	 90 	 Not limited 	 	 Not limited 		 Not limited 	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map	Paths and trail	s	Off-road motorcycle trai	ls	Golf fairways 	3
	unit	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
324D2: Dickman, moderately eroded	 90	 Not limited	 	 Not limited	 	 Somewhat limited Slope	 0.63
354: Aquolls, ponded	 100	 Not rated 	 	 Not rated 		 Not rated 	
368: Macksburg	 85 	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	1.00
369: Winterset	 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
370: Sharpsburg	 95	 Not limited	 	 Not limited		 Not limited	
370B: Sharpsburg	95	 Not limited	 	 Not limited		 Not limited	
371C2: Sharpsburg, moderately eroded	 35	 Not limited	 	 Not limited		 Not limited 	
Nira, moderately eroded	 30 	 Not limited 	 	 Not limited 	 	 Somewhat limited Depth to saturated zone	0.19
371D2: Sharpsburg, moderately eroded	 50	 Not limited	 	 Not limited 	 	 Somewhat limited Slope	0.63
Nira, moderately eroded	 20 	 Not limited 	 	 Not limited 	 	 Somewhat limited Slope Depth to saturated zone	 0.63 0.19
421C2: Gara, moderately eroded	 35	 Not limited	 	 Not limited 	 	 Not limited 	
Bucknell, moderately eroded		-	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	1.00
421D2: Gara, moderately eroded	 35	 Not limited	 	 Not limited 	 	 Somewhat limited Slope	 0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit		s	Off-road motorcycle trai	ls	Golf fairways 		
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
421D2: Bucknell, moderately eroded	:	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 0.63	
421E2: Gara, moderately eroded	 40 	 Somewhat limited Slope	 0.02	 Not limited 	 	 Very limited Slope	1.00	
Bucknell, moderately eroded		 Very limited Depth to saturated zone Slope	 1.00 0.02	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone Slope	 1.00 1.00	
435: Zook, occasionally flooded	 40 	 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	
Mt. Sterling, occasionally flooded	 35 	 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	
469C2: Lamoni, moderately eroded	 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	
Clarinda, moderately eroded	:	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	1.00	
Shelby, moderately eroded	20	 Not limited	 	 Not limited		 Not limited		
469C3: Lamoni, severely eroded	 35 	 - Very limited Depth to saturated zone		 		 	 1.00	
Clarinda, severely eroded	30	 Very limited Depth to saturated zone Too clayey	 1.00 1.00	 Very limited Depth to saturated zone Too clayey	 1.00 1.00	 Very limited Depth to saturated zone Too clayey	1.00	
Shelby, severely eroded	 20	 Not limited 	 	 Not limited 		 Not limited 		

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map		s	Off-road motorcycle trai	ls	Golf fairways 	3
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
470D2: Lamoni, moderately eroded	 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 0.63
Shelby, moderately eroded	 35 	 Not limited 	 	 Not limited 		 Somewhat limited Slope	0.63
545B: Zook	 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
Ely	 30 	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to saturated zone	 1.00
Gullied land	20	 Not rated 	 	 Not rated 	 	 Not rated 	
569C: Nira	 45 	 Not limited 	 	 Not limited 	 	 Somewhat limited Depth to saturated zone	0.19
Clearfield	 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
579E3: Bucknell, severely eroded	 55 	 Very limited Depth to saturated zone Slope	 1.00 0.02	 	 1.00	Very limited Depth to saturated zone Slope	 1.00 1.00
Hedrick, severely eroded	 35 	 Somewhat limited Slope 	 0.02 	 Not limited 		 Very limited Slope Depth to saturated zone	 1.00 0.19
794C2: Armstrong, moderately eroded	 65 	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	
Ladoga, moderately eroded	30	 Not limited 	 	 Not limited 	 	 Not limited 	
822D2: Lamoni, moderately eroded	 55 	 	 1.00 	 - Very limited Depth to saturated zone 	 1.00 	 	 1.00 0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit		s	Off-road motorcycle trai 	ls	 Golf fairways 	ı
	 	Rating class and	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
870B: Sharpsburg, terrace	 85 	 Not limited 	 	 Not limited 	 	 Not limited 	
870C2: Sharpsburg, terrace, moderately eroded	 85 	 Not limited 	 	 Not limited 	 	 Not limited 	
870D2: Sharpsburg, terrace, moderately eroded	 75 	 Not limited	 	 Not limited	 	 Somewhat limited Slope	0.63
876B: Ladoga, terrace	 100	 Not limited 	 	 Not limited 	 	 Not limited 	
876C2: Ladoga, terrace, moderately eroded	 70	 Not limited	 	 Not limited	 	 Not limited	
876D2: Ladoga, terrace, moderately eroded	 75	 Very limited Water erosion	 1.00	 Very limited Water erosion	 1.00	 Somewhat limited Slope	0.63
2368B: Macksburg	 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
Nira	 25 	 Not limited 	 	 Not limited 	 	 Somewhat limited Depth to saturated zone	 0.19
5030: Pits, limestone quarries	 100	 Not rated	 	 Not rated	 	 Not rated	
5040: Udorthents, loamy	 100	 Not rated	 	 Not rated		 Not rated	
5041: Udorthents, reclaimed	 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)

and soil name	Pct. of map unit	basements	out	Dwellings with basements 		Small commercial buildings 	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7: Wiota, rarely	 	 	 	 		 	
flooded	85 	Very limited Flooding Shrink-swell 	 1.00 0.50 	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 0.61 0.50	Very limited Flooding Shrink-swell 	 1.00 0.50
7B: Wiota, rarely	į Į		į Į	<u> </u> 	į Į	 	į
flooded	85 	Very limited Flooding Shrink-swell	 1.00 0.50 	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 0.61 0.50	Very limited Flooding Shrink-swell 	 1.00 0.50
8B: Judson	 85 	 Somewhat limited Shrink-swell	0.50	 Somewhat limited Shrink-swell	0.50	 Somewhat limited Shrink-swell	0.50
15B: Olmitz	 35 	 Somewhat limited Shrink-swell 	0.50	 Somewhat limited Depth to saturated zone Shrink-swell	 0.61 0.50	 Somewhat limited Shrink-swell 	 0.50
Ely	 30 	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	saturated zone	 1.00 0.50	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50
Zook	 20 	 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
16: Nodaway, occasionally	 	 	 	 	 	 	
flooded	55 	Very limited Flooding Shrink-swell 	 1.00 0.50 	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 0.61 0.50	Very limited Flooding Shrink-swell 	 1.00 0.50
Kennebec, occasionally flooded	 35 	 - Very limited Flooding Shrink-swell	 1.00 0.50		 1.00 0.61	-	 1.00 0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	basements	ut	Dwellings with basements	ı	Small commercia buildings 	1
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
24C2: Shelby, moderately eroded	 85	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited Slope	 0.88
		 		 		Shrink-swell	0.50
24D2: Shelby, moderately eroded	 70	 Somewhat limited Slope	0.63	 Somewhat limited Slope	0.63	 Very limited Slope	 1.00
	j I	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
24E: Shelby	 60 	 Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Shrink-swell	 1.00 0.50		 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50
24F: Shelby	 65 	 Very limited Slope	 1.00	 Very limited Slope	 1.00	 Very limited Slope	 1.00
43: Bremer, rarely	 	Shrink-swell 	0.50 	Shrink-swell 	0.50 	Shrink-swell 	0.50
flooded	85 	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00
45B:							
Zook	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
Ely	 20 	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50
54: Zook, occasionally flooded	 90 	 Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 	Very limited Flooding 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	basements	ut	Dwellings with basements	ı	Small commercia buildings	1
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54+: Zook, occasionally flooded, overwash	 80	 Very limited Flooding	 1.00	 Very limited Flooding	 1.00	 Very limited Flooding	 1.00
	 	Depth to saturated zone Shrink-swell	1.00	Depth to saturated zone Shrink-swell	1.00	Depth to saturated zone Shrink-swell	1.00
76B: Ladoga	 95 	 Very limited Shrink-swell 	 1.00 	 Very limited Shrink-swell Depth to saturated zone	 1.00 0.61	 Very limited Shrink-swell 	 1.00
76C: Ladoga	 75 	 Very limited Shrink-swell 	 1.00 	 Very limited Shrink-swell Depth to saturated zone	 1.00 0.61	 Very limited Shrink-swell Slope	 1.00 0.88
76D: Ladoga	 85 	 Very limited Shrink-swell Slope 	 1.00 0.63 	 Very limited Shrink-swell Slope Depth to saturated zone	 1.00 0.63 0.61	 Very limited Slope Shrink-swell 	 1.00 1.00
76D2: Ladoga, moderately eroded	 60 	 Very limited Shrink-swell Slope 	 1.00 0.63	 Very limited Shrink-swell Slope Depth to saturated zone	 1.00 0.63 0.61	 Very limited Slope Shrink-swell	 1.00 1.00
86: Mt. Sterling, occasionally	 	 		 		 	
flooded	 60 	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 1.00	 Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 0.50
Zook, occasionally flooded, overwash	 25 	 Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00
88: Nevin, rarely 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

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	basements	ut	Dwellings with basements 		Small commercia buildings 	1
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93D2: Shelby, moderately eroded	 35	 Somewhat limited Slope	 0.63	 Somewhat limited Slope	 0.63	 Very limited Slope	 1.00
	į	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Adair, moderately eroded	 25	 Very limited	 	 Very limited	 	 Very limited	
	 	Depth to saturated zone Shrink-swell Slope	1.00 0.73 0.63	Depth to saturated zone Shrink-swell Slope	1.00 0.73 0.63	Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.73
93E2:						 	i
Shelby, moderately eroded	 45 	 Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50
Adair, moderately							
eroded	30 	Very limited Depth to saturated zone Slope	 1.00 1.00	Very limited Depth to saturated zone Slope	 1.00 1.00	Very limited Slope Depth to saturated zone	 1.00 1.00
172: Wabash, frequently	 	Shrink-swell 	0.73 	Shrink-swell 	0.73 	Shrink-swell 	0.73
ponded, occasionally flooded	 90	 Very limited		 Very limited	<u> </u> 	 Very limited	
1100ded	90 	Flooding Depth to saturated zone	1.00	Flooding Depth to saturated zone	1.00	Flooding Depth to saturated zone	1.00
	; 	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
179E: Gara	 60 	 Very limited Slope	 1.00	 Very limited Slope	 1.00	 Very limited Slope	 1.00
	 	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
179F: Gara	65	Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50	 Very limited Slope Shrink-swell	 1.00 0.50
179G:	 	Shrink-swell 		Shrink-swell		Shrink-swell	
Gara	70 70 	 Slope Shrink-swell	1.00	 Very limited Slope Shrink-swell	1.00	 Very limited Slope Shrink-swell	1.00
192D2: Adair, moderately							
eroded	55 	Very limited Depth to saturated zone Shrink-swell	1.00	Very limited Depth to saturated zone Shrink-swell	1.00	Very limited Slope Depth to	1.00
		Shrink-swell Slope	0.73	Shrink-swell Slope	0.73	saturated zone Shrink-swell	0.73

Dwellings and Small Commercial Buildings--Continued

and soil name	Pct. of map unit	basements	ut	Dwellings with basements		Small commercia buildings 	1
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220: Nodaway, occasionally flooded	 80	-		 Very limited		 Very limited	
		Flooding Shrink-swell 	1.00 0.50 	Flooding Depth to saturated zone Shrink-swell	1.00 0.61 0.50	Flooding Shrink-swell 	1.00 0.50
222C2: Clarinda, moderately eroded	 75	 Very limited		 Very limited		 Very limited	
		Depth to saturated zone Shrink-swell	1.00 1.00	Depth to saturated zone Shrink-swell	1.00 1.00	Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.88
222D: Clarinda	 75	 Very limited Depth to	 1.00	 Very limited Depth to	 1.00	 Very limited Slope	 1.00
		saturated zone Shrink-swell Slope	1.00	saturated zone Shrink-swell Slope	1.00	Depth to saturated zone Shrink-swell	1.00
222D2: Clarinda, moderately				 	 		
eroded	70 	Very limited Depth to saturated zone Shrink-swell Slope	 1.00 1.00 0.63	Very limited Depth to saturated zone Shrink-swell Slope	 1.00 1.00 0.63	Very limited Slope Depth to saturated zone Shrink-swell	 1.00 1.00 1.00
222D3: Clarinda, severely		 	 	 	 	 -	
eroded	70 	Very limited Depth to saturated zone Shrink-swell Slope	 1.00 1.00 0.63	Very limited Depth to saturated zone Shrink-swell Slope	 1.00 1.00 0.63	Very limited Slope Depth to saturated zone Shrink-swell	 1.00 1.00 1.00
248: Wabash, occasionally ponded, occasionally		 	 	 	 	 	
flooded	85	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 1.00
269: Humeston, 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

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	basements	ut	Dwellings with basements		Small commercia buildings 	ıl
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
273B: Olmitz	 80 	 Somewhat limited Shrink-swell 	 0.50 	 Somewhat limited Depth to saturated zone Shrink-swell	 0.61 0.50	 Somewhat limited Shrink-swell 	 0.50
273C: Olmitz	 75 	 Somewhat limited Shrink-swell 	 0.50 	 Somewhat limited Depth to saturated zone Shrink-swell	 0.61 0.50	 Somewhat limited Slope Shrink-swell	 0.88 0.50
324C2: Dickman, moderately eroded	 90 	 Not limited	 	 Not limited 	 	 Somewhat limited Slope	0.88
324D2: Dickman, moderately eroded	 90 	 Somewhat limited Slope	 0.63	 Somewhat limited Slope	 0.63	 Very limited Slope	 1.00
354: Aquolls, ponded	 100	 Not rated		 Not rated	 	 Not rated	
368: Macksburg	 85 	 Very limited Depth to saturated zone Shrink-swell	 1.00 1.00	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	 Very limited Depth to saturated zone Shrink-swell	1.00
369: Winterset	 100 	 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
370: Sharpsburg	 95 	 Very limited Shrink-swell 	 1.00 	 Somewhat limited Depth to saturated zone Shrink-swell	0.61	 Very limited Shrink-swell 	
370B: Sharpsburg	 95 	 Very limited Shrink-swell 	 1.00 	 Somewhat limited Depth to saturated zone Shrink-swell	 0.61 0.50	 Very limited Shrink-swell 	1.00
371C2: Sharpsburg, moderately eroded	 35 	 Very limited Shrink-swell 	 1.00	 Somewhat limited Depth to saturated zone Shrink-swell	 0.61 0.50	 - Very limited Shrink-swell Slope	 1.00 0.88

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings witho basements	ut	Dwellings with basements		Small commercia buildings 	al
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
371C2:		 		 		 	
Nira, moderately	i		İ		i		i
eroded	30	Somewhat limited	İ	Very limited	ĺ	Somewhat limited	j
		Shrink-swell	0.50	Depth to	1.00	Slope	0.88
		Depth to	0.39	saturated zone		Shrink-swell	0.50
	 	saturated zone		Shrink-swell	0.50	Depth to saturated zone	0.39
371D2:		 		 		 	
Sharpsburg,	į	İ	į	į	į	İ	į
moderately eroded	50	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Slope	0.63	Slope	1.00
		Slope	0.63	Depth to	0.61	Shrink-swell	1.00
				saturated zone			
				Shrink-swell	0.50		1
Nira, moderately		 		 	l	 	i
eroded	20	Somewhat limited	İ	 Very limited	i	 Very limited	i
	İ	Slope	0.63	Depth to	1.00	Slope	1.00
	j	Shrink-swell	0.50	saturated zone	ĺ	Shrink-swell	0.50
		Depth to	0.39	Slope	0.63	Depth to	0.39
		saturated zone		Shrink-swell	0.50	saturated zone	!
421C2:		 		 		 	
Gara, moderately					i	 	i
eroded	35	Somewhat limited	i	Somewhat limited	i	Somewhat limited	i
	į	Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
		[[[Shrink-swell	0.50
D., alama 11 . madamaka 1							
Bucknell, moderately eroded		 Very limited		 Very limited		 Very limited	1
eroded	33	Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
	i	Shrink-swell	1.00	Shrink-swell	0.78	Shrink-swell	1.00
	İ	İ	İ	į	İ	Slope	0.88
421D2:							
Gara, moderately		 		 		 	1
eroded	35	Somewhat limited		Somewhat limited	i	 Very limited	i
		Slope	0.63	Slope	0.63	Slope	1.00
	İ	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					ļ		!
Bucknell, moderately		 		 		 	1
eroded	30	: -	1 00	Very limited	1 00	Very limited	1 00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope Depth to	1.00
		Shrink-swell	1.00	Shrink-swell	0.78	saturated zone	1
		Slope	0.63	Slope	0.63	Shrink-swell	1.00
	[!		!		!	[
421E2:							
Gara, moderately eroded		 Town limit		 Town limited	1	 	1
eroded	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	1	Slope Shrink-swell	0.50	Slope Shrink-swell	0.50	Slope Shrink-swell	0.50
	1	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, 5.55	J D O	10.00	J D#	10.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map	basements	ut	Dwellings with basements		Small commercia buildings 	al
	unit 	 Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
421E2: Bucknell, moderately eroded		 - Very limited	 1.00	 - Very limited	 1.00	 	 1.00
		Depth to saturated zone Shrink-swell Slope	 1.00 1.00 1.00	Depth to saturated zone Slope Shrink-swell	1.00	Slope Depth to saturated zone Shrink-swell	1.00 1.00 1.00
435: Zook, occasionally flooded	 40	 Very limited		 Very limited	 	 Very limited	
	 	Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Mt. Sterling, occasionally	 	 		 	 	 	
flooded	35 	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 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	 1.00 1.00 0.50
469C2: Lamoni, moderately eroded		 				 	
eroded	35 	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	Very limited Depth to saturated zone Slope Shrink-swell	1.00 0.88 0.50
Clarinda, moderately eroded	:	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
Shelby, moderately eroded	 20 	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited	 0.88 0.50
469C3: Lamoni, severely eroded	 35 	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	saturated zone	 1.00 0.50	saturated zone	 1.00 0.88 0.50
Clarinda, severely eroded	30	 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

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	basements	out	Dwellings with basements		Small commercia buildings 	1
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
469C3: Shelby, severely eroded	 20 	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited Shrink-swell	 0.50	 Somewhat limited Slope Shrink-swell	 0.88 0.50
470D2: Lamoni, moderately eroded	 40 	Very limited Depth to saturated zone Slope Shrink-swell	 1.00 0.63 0.50	Very limited Depth to saturated zone Slope Shrink-swell	 1.00 0.63 0.50	Very limited Slope Depth to saturated zone	 1.00 1.00 0.50
Shelby, moderately eroded	 35 	 Somewhat limited Slope Shrink-swell	0.63	 Somewhat limited Slope Shrink-swell	 0.63 0.50	 Very limited Slope Shrink-swell	 1.00 0.50
545B: Zook	 35 	Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00
Ely	 30 	Shrink-swell Very limited Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Shrink-swell Very limited Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Shrink-swell Very limited Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Gullied land	20	 Not rated	į Į	 Not rated	į Į	 Not rated	į
569C: Nira	 45 	 Somewhat limited Shrink-swell Depth to saturated zone	 0.50 0.39 	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	 Somewhat limited Slope Shrink-swell Depth to saturated zone	 0.88 0.50 0.39
Clearfield	 35 	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	Very limited Depth to saturated zone Slope Shrink-swell	 1.00 0.88 0.50
579E3: Bucknell, severely eroded	 55	 Very limited	 	 Very limited	 	 Very limited	
	 	Depth to saturated zone Slope Shrink-swell	1.00 1.00 0.50	Depth to saturated zone Slope Shrink-swell	1.00 1.00 0.50	Slope Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Hedrick, severely eroded	 35 	 Very limited Slope Shrink-swell Depth to saturated zone	 1.00 0.50 0.39	 Very limited Depth to saturated zone Slope Shrink-swell	 1.00 1.00 0.50	 Very limited Slope Shrink-swell Depth to saturated zone	 1.00 0.50 0.39

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	basements	ut	Dwellings with basements		Small commercia buildings 	al
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
794C2:		 				 	
Armstrong,	İ	j	į	j	į	j	į
moderately eroded	65	:	:	Very limited		Very limited	
		Depth to	1.00	-	1.00		1.00
		saturated zone Shrink-swell	0.50	saturated zone Shrink-swell	0.50	saturated zone Slope	0.88
		SHIIIK-SWEII		SHIIIK-SWEII		Shrink-swell	0.50
Ladoga, moderately		 		 		 	
eroded	30	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		 		Depth to saturated zone	0.61 	Slope 	0.88
822D2:		 		 		 	
Lamoni, moderately eroded		 	į	 	į	 	į
eroded	55	Depth to	1.00	Very limited Depth to	1.00	Very limited Slope	1.00
		saturated zone		saturated zone		Depth to	1.00
	İ	Slope	0.63	Slope	0.63	saturated zone	İ
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
870B:		 Vom: limited		 Somewhat limited	į	 Very limited	į
Sharpsburg, terrace	65	Shrink-swell	1.00	Depth to	0.61	Shrink-swell	1.00
				saturated zone			
	İ			Shrink-swell	0.50		
870C2:							
Sharpsburg, terrace,	1	 Town limited		 Comembat limited		 Town limited	1
moderately eroded	65	Shrink-swell	1.00	Somewhat limited Depth to	0.61	Very limited Shrink-swell	1.00
				saturated zone		Slope	0.88
	 	 -	İ	Shrink-swell	0.50	 	
870D2:							
Sharpsburg, terrace, moderately eroded		 Very limited		 Somewhat limited		 Very limited	
		Shrink-swell	1.00	Slope	0.63	Slope	1.00
		Slope	0.63	Depth to	0.61	Shrink-swell	1.00
	 	 		saturated zone Shrink-swell	0.50	 	1
	 			SHIIHK-SWEII			
876B: Ladoga, terrace	 100	 Verv limited		 Very limited	 	 Very limited	
		Shrink-swell	1.00	-	1.00		1.00
	İ	j	į	Depth to	0.61	į	į
		 		saturated zone		 	
876C2:		 -	į		į	 -	į
Ladoga, terrace, moderately eroded	 70	 Verv limited		 Very limited		 Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	İ		i	Depth to	0.61	Slope	0.88
		•	'	saturated zone			

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings witho basements	ut	Dwellings with basements		Small commercia buildings 	al
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
876D2:	 			 		 	
Ladoga, terrace, moderately eroded	 75 	 Shrink-swell Slope 	 1.00 0.63 	 Shrink-swell Slope Depth to saturated zone	 1.00 0.63 0.61	 Very limited Slope Shrink-swell 	 1.00 1.00
2368B:	 			 		 	
Macksburg	70 	Very limited Depth to saturated zone Shrink-swell	 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	Very limited Depth to saturated zone Shrink-swell	 1.00 1.00
Nira	 25 	Somewhat limited Shrink-swell Depth to saturated zone	 0.50 0.39	 Very limited Depth to saturated zone Shrink-swell	 1.00 0.50	 Somewhat limited Shrink-swell Depth to saturated zone	 0.50 0.39
5030: Pits, limestone quarries	 100	 Not rated	 	 Not rated	 	 Not rated	
5040: Udorthents, loamy	 100	 Not rated		 Not rated		 Not rated	
5041: Udorthents, reclaimed	 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	streets	ıd	 Shallow excavati 	ons	 Lawns and landsca 	aping
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7:		 				 	
Wiota, rarely							
flooded	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Depth to	0.61		
		Low strength	1.00	saturated zone			
		Shrink-swell	0.50	Cutbanks cave	0.10	 	
7B:							
Wiota, rarely							
flooded	85	: -		Somewhat limited		Not limited	
	ļ	Frost action	1.00		0.61	ļ	!
	ļ	Low strength	1.00	· ·		!	!
		Shrink-swell	0.50	Cutbanks cave	0.10	 	
8B:			į		į		į
Judson	85		!	Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10	 	-
		Low strength Shrink-swell	1.00	l I		 	
		Shrink-swell	0.50			 	
15B:				 		Israe 12-24-3	
Olmitz	35	: -		Somewhat limited		Not limited	-
		Low strength	1.00	-	0.61	 	-
		Shrink-swell Frost action	0.50 0.50	saturated zone Cutbanks cave	0.10	 	
E1		 		 		 	
Ely	30	Depth to	1.00	Very limited Depth to	1.00	Very limited Depth to	1.00
		saturated zone	1	saturated zone	1	saturated zone	1
		Frost action	1.00	Cutbanks cave	0.10	Baculaced Zolle	1
		Low strength	1.00				
Zook	20	 Verv limited		 Very limited		 Very limited	l I
	i	Depth to	1.00	-	1.00	:	1.00
	i	saturated zone	i	saturated zone	i	saturated zone	i
	i	Frost action	1.00	Cutbanks cave	0.10	İ	i
	į	Low strength	1.00	Too clayey	0.01	 -	į
16: Nodaway, occasionally		 		 		 	
flooded	55	 Very limited	I	 Somewhat limited	1	 Somewhat limited	1
	33	Frost action	1.00	Depth to	0.61	Flooding	0.60
		Flooding	1.00	saturated zone			
	İ	Low strength	1.00	Flooding	0.60	İ	i
				Cutbanks cave	0.10	 -	į
Kennebec,		 		 		 	
occasionally		[1
flooded	35			Somewhat limited		Somewhat limited	!
		Frost action	1.00	-	0.61	Flooding	0.60
		Flooding	1.00	saturated zone			ļ
		Low strength	1.00	Flooding	0.60		ļ
	1	I	1	Cutbanks cave	0.10	I .	1

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

Map symbol and soil name	Pct. of map unit	streets	ıd	Shallow excavati	ons	Lawns and landsca 	ping
	<u> </u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
24C2: Shelby, moderately eroded	 85 	 Somewhat limited Shrink-swell Frost action	0.50	 Somewhat limited Cutbanks cave	 0.10	 Not limited 	
24D2: Shelby, moderately eroded	 70 	 Somewhat limited Slope Shrink-swell Frost action	 0.63 0.50 0.50	 Somewhat limited Slope Cutbanks cave	 0.63 0.10	 Somewhat limited Slope 	0.63
24E: Shelby	 60 	 Very limited Slope Shrink-swell Frost action	 1.00 0.50 0.50	 Very limited Slope Cutbanks cave	 1.00 0.10	 Very limited Slope 	1.00
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Shrink-swell Frost action	 1.00 0.50 0.50	 Very limited Slope Cutbanks cave	 1.00 0.10	 - Very limited Slope -	 1.00
24F: Shelby	 65 	 Very limited Slope Shrink-swell Frost action	 1.00 0.50 0.50	 Very limited Slope Cutbanks cave	 1.00 0.10	 Very limited Slope 	 1.00
43: Bremer, rarely flooded	 85 	Very limited Depth to saturated zone Frost action Low strength	 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	 1.00 0.10	Very limited Depth to saturated zone	 1.00
45B: Zook	 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 Too clayey	 1.00 0.10 0.01	 Very limited Depth to saturated zone 	1.00
Ely	 20 		 1.00 1.00 1.00		 1.00 0.10	 Very limited Depth to saturated zone 	 1.00
54: Zook, occasionally flooded	 90 	 	 1.00 1.00 1.00	 	 1.00 0.60 0.10	 Very limited Depth to saturated zone Flooding	1.00

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

and soil name	Pct. of map unit	streets	.d	Shallow excavati	ons	Lawns and landsca	ping
	İ 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54+: Zook, occasionally	 	 	 	 -	 	 	
flooded, overwash	80	Depth to	1.00		1.00	Very limited Depth to	1.00
	 	saturated zone Frost action Flooding	 1.00 1.00	saturated zone Flooding Cutbanks cave	 0.60 0.10	saturated zone Flooding	0.60
76B:	 	 				 	<u> </u>
Ladoga	95	Very limited Low strength	1.00	Somewhat limited Depth to	0.61	Not limited	ļ
		Shrink-swell Frost action	1.00	saturated zone Cutbanks cave	0.10	 	
76C: Ladoga	 75	 Very limited		 Somewhat limited		 Not limited	
-	 	Low strength Shrink-swell	1.00	Depth to saturated zone	0.61	 	į į
		Frost action	0.50	Cutbanks cave	0.10	 	
76D: Ladoga	 85	 Very limited Low strength	 1.00	 Somewhat limited Slope	 0.63	 Somewhat limited Slope	 0.63
	 	Shrink-swell Slope	1.00	Slope Depth to saturated zone	0.61	Slope 	
	; 			Cutbanks cave	0.10	i I	į
76D2: Ladoga, moderately	 	 		 		 	
eroded	60 	Low strength	1.00	Somewhat limited	0.63	Somewhat limited Slope	0.63
	 	Shrink-swell Slope 	1.00 0.63	Depth to saturated zone Cutbanks cave	0.61 0.10	 	
86: Mt. Sterling,	 	 		 	 	 	
occasionally flooded	 60		:	 Very limited	1	 Very limited	
	 	Depth to saturated zone Frost action	1.00 1.00	Depth to saturated zone Flooding	1.00 0.60	Depth to saturated zone Flooding	1.00 0.60
	 	Flooding	1.00	Cutbanks cave	0.10	Fiscuring 	
Zook, occasionally flooded, overwash	 25		į Į	 Very limited	İ	 Very limited	į į
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	saturated zone	1.00
	 	Frost action Flooding	1.00	Flooding Cutbanks cave 	0.60	Flooding 	0.60
88: Nevin, rarely	 	 		 			
flooded	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
		Frost action Low strength	1.00	Cutbanks cave	0.10	ļ	

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

Map symbol and soil name	Pct. of map unit	streets		Shallow excavati 	ons	Lawns and landscaping	
	<u> </u>	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93D2:		 		 		 	
Shelby, moderately							
eroded	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	-	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50	 		 	
Adair, moderately	 	 		 		 	l
eroded	25	 Verv limited		 Very limited	i	 Very limited	i
croaca	23	Depth to	1.00	Depth to	1.00	Depth to	1.00
	i	saturated zone		saturated zone		saturated zone	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Shrink-swell	0.73	Cutbanks cave	0.10		i
	İ		İ	İ	i	İ	i
93E2:							
Shelby, moderately							
eroded	45		:	Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
	l i	Frost action	0.50			 	
Adair, moderately		 		1	l	 	l
eroded	30	 Very limited	l	 Very limited		 Very limited	
eroded	30	Depth to	1.00	Depth to	1.00	Depth to	1.00
	i	saturated zone		saturated zone		saturated zone	
	i	Frost action	1.00	Slope	1.00	Slope	1.00
	İ	Slope	1.00	Cutbanks cave	0.10	i -	į
172:					ļ		
Wabash, frequently							
ponded,		 				 	
occasionally flooded		 Town limited		 Town limited		 Town limited	
1100ded	90	Shrink-swell	1.00	Very limited Depth to	1.00	Very limited Depth to	1.00
	 	Depth to	1.00	saturated zone	1	saturated zone	1
		saturated zone		Ponding	1.00	Too clayey	1.00
		Flooding	1.00	Flooding	0.60	Ponding	1.00
	İ		İ			İ	İ
179E:							
Gara	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
179F:	 	 		 		 	
Gara	65	 Very limited	i	 Very limited	i	 Very limited	i
•		Slope	1.00	Slope	1.00	Slope	1.00
	İ	Shrink-swell	0.50	Cutbanks cave	0.10	i -	i
	İ	Frost action	0.50	İ	Ì	İ	İ
				!		!	
179G:							[
Gara	70	Very limited	:	Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
	 	Shrink-swell Frost action	0.50	Cutbanks cave	0.10	 	
	1	riost action	0.50	I	1	I	1

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

Map symbol and soil name	Pct. of map unit	streets	d	Shallow excavati 	ons	Lawns and landsca - 	aping
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
192D2: Adair, moderately eroded	 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
	<u> </u> 	Frost action Shrink-swell	1.00	Slope Cutbanks cave	0.63	Slope	0.63
220: Nodaway, occasionally	 	 	 	 	 	 	
flooded	80	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
222C2: Clarinda, moderately eroded		 Very limited Shrink-swell	 1.00	 Very limited Depth to	1.00	 Very limited Depth to	 1.00
		Depth to saturated zone Frost action	1.00	saturated zone Too clayey Cutbanks cave	0.50	saturated zone	
222D: Clarinda	 75 	Shrink-swell Depth to	 1.00 1.00	 Very limited Depth to saturated zone	1.00	 Very limited Depth to saturated zone	1.00
	 	saturated zone Frost action	1.00	Slope Too clayey 	0.63	Slope 	0.63
222D2: Clarinda, moderately eroded		 Very limited	 	 Very limited	 	 Very limited	
		Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Depth to saturated zone Slope Too clayey	1.00 0.63 0.50	Depth to saturated zone Slope	1.00 0.63
222D3: Clarinda, severely eroded	 70	 Very limited	 	 Very limited		 Very limited	
		Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00	Depth to saturated zone Slope Too clayey	1.00 0.63 0.50	Depth to saturated zone Too clayey Slope	1.00 1.00 0.63
248: Wabash, occasionally ponded, occasionally	 - 	 	 	 	 	 	
flooded	85 	Very limited Shrink-swell Depth to saturated zone Flooding	 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	 1.00 1.00 0.60	Very limited Depth to saturated zone Ponding Flooding	 1.00 1.00 0.60

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

and soil name	Pct. of map unit	streets			Lawns and landsca	ping	
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Valu
269: Humeston, occasionally flooded	 100	 Very limited	 	 Very limited		 Very limited	
		Depth to saturated zone Frost action Flooding	1.00 1.00 1.00		1.00 0.60 0.10	: -	1.00
273B: Olmitz	 80 	 Very limited Low strength Shrink-swell Frost action	 1.00 0.50 0.50	 Somewhat limited Depth to saturated zone Cutbanks cave	 0.61 0.10	 Not limited 	
273C: Olmitz	 75 			Cutbanks cave 	İ İ	 Not limited 	
324C2: Dickman, moderately eroded	 90			 Very limited		 Not limited	
324D2: Dickman, moderately eroded	 90 	 - Somewhat limited Slope Frost action	 0.63 0.50	 - Very limited Cutbanks cave Slope	 1.00 0.63	 - Somewhat limited Slope 	 0.63
354: Aquolls, ponded	 100	 Not rated 		 Not rated 	 	 Not rated 	
368: Macksburg	 85 	 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
369: Winterset	 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
370: Sharpsburg	 95 	 Very limited Frost action Low strength Shrink-swell	 1.00 1.00	 Somewhat limited Depth to saturated zone Cutbanks cave	0.61	 Not limited 	
370B: Sharpsburg	 95 	 Very limited Frost action Low strength Shrink-swell	 1.00 1.00 1.00	 Somewhat limited Depth to saturated zone Cutbanks cave	0.61	 Not limited 	

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

and soil name c	Pct. of map unit	streets	d	Shallow excavati 	ons	Lawns and landscaping 		
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
371C2:	 	 		 		 		
Sharpsburg,	İ		İ		i		i	
moderately eroded	35	Very limited	į	Somewhat limited	į	Not limited	j	
		Frost action	1.00	Depth to	0.61			
		Low strength	1.00	saturated zone				
	 	Shrink-swell	1.00	Cutbanks cave	0.10			
Nira, moderately	 	 	l I	 		 		
eroded	30	 Verv limited	i	 Very limited	i		i	
		Frost action	1.00	-	1.00	!	0.19	
İ	j	Low strength	1.00	saturated zone	į	saturated zone	į	
		Shrink-swell	0.50	Cutbanks cave	0.10		İ	
371D2:	 	 		 		 		
Sharpsburg,	 	 	1	 		 	1	
moderately eroded	50	 Very limited	i	Somewhat limited	i	Somewhat limited	i	
- i	İ	Frost action	1.00	Slope	0.63	Slope	0.63	
İ	ĺ	Low strength	1.00	Depth to	0.61	İ	İ	
		Shrink-swell	1.00	saturated zone				
	 			Cutbanks cave	0.10			
Nira, moderately	 	 		 		 		
eroded	20	 Very limited		 Very limited	i		i	
i	İ	Frost action	1.00	: -	1.00	Slope	0.63	
	İ	Low strength	1.00	saturated zone	į	Depth to	0.19	
		Slope	0.63	Slope	0.63	saturated zone		
				Cutbanks cave	0.10			
421C2:	 	 		 		 		
Gara, moderately			İ		i		i	
eroded	35	Somewhat limited	į	Somewhat limited	į	Not limited	į	
		Shrink-swell	0.50	Cutbanks cave	0.10			
		Frost action	0.50					
Bucknell, moderately	 	 		 		l I		
eroded	'	 Verv limited	İ	 Very limited		 Very limited	i	
		Depth to	1.00	: -	1.00	: -	1.00	
	İ	saturated zone	į	saturated zone	į	saturated zone	į	
		Shrink-swell	1.00	Too clayey	0.12			
		Frost action	0.50	Cutbanks cave	0.10			
421D2:	 	 	1	 		 		
Gara, moderately			İ		i		i	
eroded	35	Somewhat limited	İ	Somewhat limited	i	Somewhat limited	i	
j		Slope	0.63	Slope	0.63	Slope	0.63	
		Shrink-swell	0.50	Cutbanks cave	0.10			
		Frost action	0.50					
Bucknell, moderately	 	 		 		 		
eroded		 Very limited	İ	 Very limited	i	 Very limited	i	
eroaea	i	: -	1.00	Depth to	1.00		1.00	
eroded		Depth to	1 - 0 0	Depth to	11.00	Depth to	1	
e10ded	 	saturated zone	İ	saturated zone	į	saturated zone		
eroded	 		 1.00 1.00 0.63	. –	0.63		0.63	

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

and soil name	Pct. of map unit	streets		Shallow excavations		Lawns and landscaping 	
		Rating class and	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421E2: Gara, moderately eroded	 40 	 Very limited Slope Shrink-swell Frost action	 1.00 0.50 0.50	 Very limited Slope Cutbanks cave	 1.00 0.10	 Very limited Slope 	 1.00
Bucknell, moderately eroded	1	 Very limited Depth to saturated zone Shrink-swell Slope	 1.00 1.00 1.00	 Very limited Depth to saturated zone Slope Too clayey	 1.00 1.00 0.12	Very limited Depth to saturated zone Slope	 1.00 1.00
435: Zook, occasionally 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 0.60 0.10	 Very limited Depth to saturated zone Flooding	 1.00 0.60
Mt. Sterling, occasionally flooded	 35 	 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
469C2: Lamoni, moderately eroded	 35 	 Very limited Depth to saturated zone Shrink-swell Frost action	 1.00 0.50 0.50	 Very limited Depth to saturated zone Too clayey Cutbanks cave	 1.00 0.28 0.10	Very limited Depth to saturated zone	 1.00
Clarinda, moderately eroded		 Very limited Shrink-swell Depth to saturated zone Frost action	 1.00 1.00 1.00	Too clayey	 1.00 0.50 0.10	 Very limited Depth to saturated zone	1.00
Shelby, moderately eroded	 20 	 Somewhat limited Shrink-swell Frost action	 0.50 0.50	 Somewhat limited Cutbanks cave 	 0.10 	 Not limited - 	
469C3: Lamoni, severely eroded	 35 	 Very limited Depth to saturated zone Shrink-swell Frost action	 1.00 0.50 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	streets	đ	Shallow excavati 	ons	Lawns and landscaping		
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
469C3: Clarinda, severely	 	 	 	 	 	 		
eroded	30	 Very limited	i	Very limited	i	 Very limited	i	
	i	Shrink-swell	1.00	Depth to	1.00	Depth to	1.00	
	į	Depth to	1.00	saturated zone	İ	saturated zone	į	
		saturated zone		Too clayey	0.50	Too clayey	1.00	
		Frost action	1.00	Cutbanks cave	0.10			
Shelby, severely								
eroded	20	Somewhat limited		Somewhat limited	10 10	Not limited		
		Shrink-swell Frost action	0.50	Cutbanks cave	0.10	 		
		Flost action	0.30	 		 	i	
470D2:			i		i		i	
Lamoni, moderately	İ		i		i		i	
eroded	40	Very limited	İ	Very limited	Ì	Very limited	İ	
		Depth to	1.00	Depth to	1.00	Depth to	1.00	
		saturated zone		saturated zone		saturated zone		
		Slope	0.63	Slope	0.63	Slope	0.63	
!		Shrink-swell	0.50	Too clayey	0.28		!	
Obalba madamakala							1	
Shelby, moderately eroded	 35	 Somewhat limited		 Somewhat limited		 Somewhat limited	1	
eroded	33	Slope	0.63	Slope	0.63	Slope	0.63	
		Shrink-swell	0.50	Cutbanks cave	0.10			
	İ	Frost action	0.50				i	
545B:								
Zook	35	:		Very limited	1	Very limited		
	 	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	
		Frost action	1.00	Cutbanks cave	0.10	saturated zone	1	
		Low strength	1.00	Too clayey	0.10	 	1	
							i	
Ely	30	Very limited	i	Very limited	i	Very limited	i	
	İ	Depth to	1.00	Depth to	1.00	Depth to	1.00	
		saturated zone		saturated zone		saturated zone		
		Frost action	1.00	Cutbanks cave	0.10			
		Low strength	1.00					
Gullied land	20	 Not rated		 Not rated		 Not rated		
E60G.		 					1	
569C: Nira	45	 Verv limited		 Very limited		 Somewhat limited		
		Frost action	1.00	Depth to	1.00	· ·	0.19	
	i	Low strength	1.00	saturated zone	i	saturated zone	i	
	İ	Shrink-swell	0.50	Cutbanks cave	0.10	İ	İ	
Clearfield	35	Very limited	1 00	Very limited	1 00	Very limited	11 00	
	 	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00	
	 	saturated zone Frost action	1.00	Too clayey	0.50	saturated zone	1	
		Low strength	1.00	Cutbanks cave	0.10	 	1	
	i					İ	i	
	1	I .	i	I .	1	I .	1	

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

and soil name o	Pct. of map	streets		Shallow excavations		Lawns and landscaping 	
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
			Ţ		Ţ.	<u> </u>	Ţ
579E3: Bucknell, severely	l I	 -		 		 	
eroded	 55	 Very limited		 Very limited		 Very limited	
eroded	33	Depth to	1.00	Depth to	1.00	Depth to	1.00
	i i	saturated zone	1	saturated zone	1	saturated zone	1
	i	Slope	1.00	Slope	1.00	Slope	1.00
	į	Shrink-swell	0.50	Too clayey	0.12		į
Hedrick, severely		 		 		 	
eroded	35	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to	1.00	Slope	1.00
		Low strength	1.00	saturated zone		Depth to	0.19
	ļ	Slope	1.00	Slope	1.00	saturated zone	ļ
	 	 		Cutbanks cave	0.10	 -	
794C2:							
Armstrong,					1		
moderately eroded	65	! -	:	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00		1.00
		saturated zone Frost action	1.00	saturated zone Cutbanks cave	0.10	saturated zone	
		Low strength	1.00	Cutbanks cave	0.10	 	
	İ				İ		İ
Ladoga, moderately						 	
eroded	30	! -	!	Somewhat limited	!	Not limited	
	l I	Low strength Shrink-swell	1.00	Depth to saturated zone	0.61	 	
		Frost action	0.50	Cutbanks cave	0.10	 	
822D2: Lamoni, moderately		 		 		 	
eroded	55	 Very limited	i	 Very limited	i	 Very limited	i
	İ	Depth to	1.00	Depth to	1.00	: -	1.00
	į	saturated zone	į	saturated zone	į	saturated zone	į
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Too clayey	0.28	 	
870B:				 		 	
Sharpsburg, terrace	85			Somewhat limited		Not limited	
		Frost action	1.00	Depth to	0.61		
	l I	Low strength Shrink-swell	1.00	saturated zone Cutbanks cave	0.10	 	
		biiiik-sweii		cutbanks cave			
870C2:					!		
Sharpsburg, terrace,		 		 Gamasahah 32m25-3	1	 	1
moderately eroded	85	very limited Frost action	1	Somewhat limited	0.61	Not limited	
	 	Low strength	1.00	Depth to saturated zone	10.61	 	
		Shrink-swell	1.00	Cutbanks cave	0.10	 	
97002.							
870D2: Sharpsburg, terrace,	 	 	1	 	1	 	1
moderately eroded		 Verv limited		 Somewhat limited	1	 Somewhat limited	1
		Frost action	1.00	Slope	0.63	Slope	0.63
	İ	Low strength	1.00		0.61	. <u>-</u>	İ
	İ	Shrink-swell	1.00	saturated zone	İ	İ	İ
				Cutbanks cave	0.10		

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

and soil name or	Pct. of map unit	streets	d	Shallow excavati 	ons	Lawns and landscaping		
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value	
876B:								
Ladoga, terrace	 100 	 Very limited Low strength Shrink-swell	 1.00 1.00	 Somewhat limited Depth to saturated zone	0.61	 Not limited 		
		Frost action	0.50	Cutbanks cave	0.10	 		
876C2: Ladoga, terrace,	 	 	 	 	 	 	 	
moderately eroded	70	-	!	Somewhat limited	0.61	Not limited		
		Low strength Shrink-swell	1.00	-	10.61	 		
		Frost action	0.50	Cutbanks cave	0.10		i	
876D2: Ladoga, terrace,	 	 	 	 	 	 	 	
moderately eroded	75	 Very limited		Somewhat limited	İ	Somewhat limited	i	
		Low strength	1.00	Slope	0.63	Slope	0.63	
		Shrink-swell	1.00		0.61		ļ	
	 	Slope	0.63	saturated zone Cutbanks cave	0.10	 -		
	 	 		Cutbanks cave	0.10	 		
2368B:	İ		İ		i		i	
Macksburg	70	Very limited	İ	Very limited	İ	Very limited	İ	
		Depth to	1.00	-	1.00		1.00	
		saturated zone	1.00	saturated zone Cutbanks cave		saturated zone		
	 	Low strength	1.00	Cutbanks cave	0.10	 		
	İ				i		i	
Nira	25	Very limited		Very limited		Somewhat limited		
		Frost action	1.00	-	1.00		0.19	
	 	Low strength Shrink-swell	1.00	saturated zone Cutbanks cave	0.10	saturated zone		
	 	SHITHK-SWEIT	0.50	Cutbanks cave	0.10	 		
5030: Pits, limestone						 Not rated		
quarries	100	Not rated 		Not rated		NOT rated 		
5040:					İ		i	
Udorthents, loamy	100	Not rated	İ	Not rated	İ	Not rated	İ	
5041: Udorthents,	 	 	 	 	 	 		
reclaimed	100	Not rated		Not rated	İ	Not rated	Ì	
AW: Animal waste lagoon	 100	 Not rated	 	 Not rated	 	 Not rated		
-		!		!		[1	
SL: Sewage lagoon	 100 	 Not rated 	 	 Not rated 	 	 Not rated 	 	
W: Water	100	 Not rated	<u> </u>	 Not rated		 Not rated	<u> </u> 	

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	absorption fields		Sewage lagoons	3
	unit 	 Rating class and limiting features	Value	Rating class and limiting features	Value
	İ		i i		i i
7:					
Wiota, rarely					!
flooded	85	Somewhat limited		Somewhat limited	
		Depth to	0.99	· -	0.71
	 	saturated zone Slow water	0.95	saturated zone Flooding	0.40
		movement	0.33	Seepage	0.05
		Flooding	0.40		
7B:	 	 			
Wiota, rarely					
flooded	85	Somewhat limited		Somewhat limited	
		Depth to	0.99	-	0.71
		saturated zone		saturated zone	
		Slow water	0.95	Flooding	0.40
	 	movement Flooding	0.40	Slope	0.32
		F100dIng			
8B: Judson	 85	 Somewhat limited		Somewhat limited	
		Slow water	0.95	Slope	0.32
	į	movement	į	Seepage	0.05
15B:	 	 			
Olmitz	35	Somewhat limited		Somewhat limited	!
		Depth to	0.99	· -	0.71
		saturated zone		saturated zone	
		Slow water movement	0.95	Slope Seepage	0.32
_					
Ely	30	Very limited	:	Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water	0.95	Slope	0.32
		movement		Seepage	0.05
Zook	 20	 Very limited		 Very limited	
	i	Slow water	1.00	_	1.00
	İ	movement	İ	saturated zone	İ
	 	Depth to saturated zone	1.00	Slope	0.32
16:	 		į		į
Nodaway,		 			
occasionally					!
flooded	55	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	10./1
	 	Slow water	0.95	Seepage	0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map	Septic tank absorption fiel	ds	Sewage lagoons 	
	unit	Í		<u> </u>	
	 	Rating class and limiting features	Value	Rating class and limiting features	Value
16: Kennebec, occasionally	 	 		 	
flooded	35 	Very limited Flooding Depth to saturated zone Slow water movement	 1.00 0.99 0.95	Very limited Flooding Depth to saturated zone Seepage	 1.00 0.71 0.05
24C2: Shelby, moderately eroded	 85 	 Very limited Slow water movement	 1.00	 Very limited Slope Seepage	 1.00 0.05
24D2:	 		 		
Shelby, moderately eroded	 70 	 Very limited Slow water movement Slope	 1.00 0.63	 Very limited Slope Seepage	 1.00 0.05
24E: Shelby	 60 	 Very limited Slope Slow water movement	 1.00 1.00	 Very limited Slope Seepage	 1.00 0.05
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Slow water movement	 1.00 1.00	 Very limited Slope Seepage	 1.00 0.05
24F: Shelby	 65 	 Very limited Slope Slow water movement	 1.00 1.00	 Very limited Slope Seepage	 1.00 0.05
43: Bremer, rarely	 	 	 	 	
flooded	85 	Very limited	 1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Seepage 	 1.00 0.40 0.05
45B: Zook	75 75	Very limited Slow water movement Posth to	1.00	Very limited Depth to saturated zone	1.00
	 	Depth to saturated zone 	1.00 	Slope 	0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of	Septic tank absorption fiel	ds	Sewage lagoons	l
	map unit	 		 	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AED.					
45B: Ely	 20 	 Very limited Depth to saturated zone Slow water	 1.00 0.95	 Very limited Depth to saturated zone Slope	 1.00 0.32
		movement		Seepage	0.05
54:	 	 		 	
Zook, occasionally flooded	 90 	Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone	 1.00 1.00
54+:	 	 			
Zook, occasionally flooded, overwash	 80 	Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Seepage	 1.00 1.00 0.05
76B:	 				
Ladoga	95 	Very limited Slow water movement Depth to saturated zone	 1.00 0.99	Somewhat limited Depth to saturated zone Slope Seepage	 0.71 0.32 0.05
76C:	 				
Ladoga	75 	Very limited Slow water movement Depth to saturated zone	 1.00 0.99	Very limited Slope Depth to saturated zone Seepage	 1.00 0.71 0.05
76D:					
Ladoga	85 	Very limited Slow water movement Depth to saturated zone Slope	 1.00 0.99 0.63	Very limited Slope Depth to saturated zone Seepage	 1.00 0.71 0.05
76D2:			į		į
Ladoga, moderately eroded	 60 	 Very limited Slow water movement Depth to	 1.00 0.99	 Very limited Slope Depth to saturated zone	 1.00 0.71
	 	saturated zone Slope	0.63	Seepage 	0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map	absorption fiel	ds	Sewage lagoons 	
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value
86: Mt. Sterling, occasionally	 	 		 	
flooded	60 	Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	 1.00 1.00 0.05
Zook, occasionally flooded, overwash	 25 	 Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Seepage	 1.00 1.00 0.05
88: Nevin, rarely flooded	 90 	 Very limited Depth to saturated zone Slow water movement Flooding	 1.00 0.95 0.40	 	 1.00 0.40 0.05
93D2: Shelby, moderately eroded	 35 	 Very limited Slow water movement Slope	 1.00 0.63	 Very limited Slope Seepage	 1.00 0.05
Adair, moderately eroded	 25 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
93E2: Shelby, moderately eroded	 45 	 Very limited Slope Slow water movement	 1.00 1.00	 Very limited Slope Seepage	 1.00 0.05
Adair, moderately eroded	 30 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 1.00	 Very limited Slope Depth to saturated zone	 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map	:	.ds	Sewage lagoons 	•
	unit	 			
		Rating class and limiting features	Value	Rating class and limiting features	Value
172: Wabash, frequently ponded, occasionally	 	 		 	
flooded	90 	Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00		 1.00 1.00 1.00
179E:	 			 	
Gara	 60 	 Very limited Slope Slow water movement	1.00	 Very limited Slope Seepage	 1.00 0.05
179F: Gara	 65 	 Very limited Slope Slow water movement	1.00	 Very limited Slope Seepage	 1.00 0.05
179G: Gara	 70 	 Very limited Slope Slow water movement	 1.00 1.00	 Very limited Slope Seepage	 1.00 0.05
192D2:	 	 		 	
Adair, moderately eroded	 55 	Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
220: Nodaway, occasionally	 	 	 	 	
flooded	80 	Very limited Flooding Depth to saturated zone Slow water movement	 1.00 0.99 0.95	Very limited Flooding Depth to saturated zone Seepage	 1.00 0.71 0.05
222C2: Clarinda, moderately eroded	:	 Very limited Slow water movement Depth to	 1.00 	 Very limited Depth to saturated zone Slope	 1.00
	 	!	1.00		į

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map	absorption fiel	ds	Sewage lagoons 	1
	unit 	 Rating class and limiting features	Value	 Rating class and limiting features	Value
222D: Clarinda	 75 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
222D2: Clarinda, moderately eroded	:	Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	Very limited Slope Depth to saturated zone	 1.00 1.00
222D3: Clarinda, severely eroded	 70 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
248: Wabash, occasionally ponded, occasionally flooded	 	 	 1.00 1.00 1.00	 - Very limited Flooding Depth to saturated zone Ponding	 1.00 1.00
269: Humeston, occasionally flooded	 100 	 Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Seepage	 1.00 1.00 0.05
273B: Olmitz	 80 	 Somewhat limited Depth to saturated zone Slow water movement	 0.99 0.95	 Somewhat limited Depth to saturated zone Slope Seepage	 0.71 0.32 0.05
273C: Olmitz	 75 	 Somewhat limited Depth to saturated zone Slow water movement	 0.99 0.95	 Very limited Slope Depth to saturated zone Seepage	 1.00 0.71 0.05

Sewage Disposal--Continued

:	-			
map				
unit	'	172 110	Pating glagg and	Value
<u> </u>	limiting features	value	limiting features	value
İ	İ	i		į
90	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
 	Seepage, bottom layer	1.00		
90	: -		Very limited	
	Filtering	1.00	Slope	1.00
			Seepage	1.00
 		1.00	l I	
 	-	0 63	 	1
	STOPE			
 100	 Not rated		 Not rated	
			 -	
 85	 Verv limited		 Verv limited	
	: -		<u>-</u>	1.00
İ	saturated zone	i	saturated zone	i
İ	Slow water	1.00	Seepage	0.05
 	movement		 	
1 100	: -	:	_	1 00
 	: -	1.00	-	1.00
 	!	1.00		0.05
 	movement			
95			!	
	!	1.00		0.71
 	!			10.05
	saturated zone		Seepage	0.05
95	 Very limited	i	 Somewhat limited	i
İ	Slow water	1.00	Depth to	0.71
	movement		saturated zone	
	Depth to	0.99	Slope	0.32
 	saturated zone		Seepage 	0.05
35 	: -	1 00	_	1 00
 	Slow water movement	1	Slope Depth to	1.00
		1		. U . / I
 	Depth to	0.99	saturated zone	i
	of map unit	of absorption fielmap unit Rating class and limiting features 90 Very limited Filtering capacity Seepage, bottom layer 90 Very limited Filtering capacity Seepage, bottom layer 100 Not rated 100 Not rated 100 Not rated 25 Very limited Depth to saturated zone Slow water movement 100 Very limited Depth to saturated zone Slow water movement 95 Very limited Slow water movement Depth to saturated zone 100 Very limited Slow water movement 100 Very limited	of absorption fields map unit	of map unit Rating class and Value Rating class and limiting features

Sewage Disposal--Continued

and soil name	Pct. of map unit	absorption fiel	ds	Sewage lagoons	
	unii c 	 Rating class and limiting features	Value	 Rating class and limiting features	Value
371C2: Nira, moderately eroded	 30 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.95	 Very limited Depth to saturated zone Slope Seepage	 1.00 1.00 0.05
371D2: Sharpsburg,	 	 	 	 	
moderately eroded	 50 	Very limited Slow water movement Depth to saturated zone Slope	 1.00 0.99 0.63	Very limited Slope Depth to saturated zone Seepage	 1.00 0.71 0.05
Nira, moderately					
eroded	20 	Very limited Depth to saturated zone Slow water movement Slope	 1.00 0.95 0.63	Very limited Slope Depth to saturated zone Seepage	 1.00 1.00 0.05
421C2:	 	 		 	
Gara, moderately eroded	 35 	 Very limited Slow water movement	 1.00	 Very limited Slope Seepage	 1.00 0.05
Bucknell, moderately eroded		Slow water	1.00		1.00
	 	movement Depth to saturated zone	1.00	saturated zone Slope 	1.00
421D2: Gara, moderately eroded	 35 	 Very limited Slow water movement Slope	 1.00 0.63	 Very limited Slope Seepage	 1.00 0.05
Bucknell, moderately eroded		Slow water movement	1.00	Depth to	 1.00 1.00
	 	Depth to saturated zone Slope	1.00 0.63	saturated zone	
421E2: Gara, moderately eroded	 40	 Very limited	 	 Very limited	
	 	Slope Slow water movement	1.00	Slope Seepage 	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	absorption fiel	ds	Sewage lagoons 	•
		Rating class and limiting features	Value	Rating class and limiting features	Value
421E2: Bucknell, moderately eroded		 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00	 Very limited Slope Depth to saturated zone	 1.00 1.00
435: Zook, occasionally flooded	 40 	 Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	 1.00 1.00
Mt. Sterling, occasionally flooded	 35 	 Very limited Flooding Slow water movement Depth to saturated zone	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	 1.00 1.00 0.05
469C2: Lamoni, moderately eroded	 35 	 Very limited Slow water movement Depth to saturated zone	 1.00 1.00	 Very limited Depth to saturated zone Slope	 1.00 1.00
Clarinda, moderately eroded		Very limited Slow water movement Depth to saturated zone	 1.00 1.00	 Very limited Depth to saturated zone Slope	 1.00 1.00
Shelby, moderately eroded	 20 	 Very limited Slow water movement	 1.00 	 Very limited Slope Seepage	 1.00 0.05
469C3: Lamoni, severely eroded	 35 	 Very limited Slow water movement Depth to saturated zone	 1.00 1.00	 	 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map	-	ds	 Sewage lagoons 	
	unit 	'	Value	 Rating class and limiting features	Value
469C3: Clarinda, severely eroded	 30 	 Very limited Slow water movement Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone Slope	 1.00 1.00
Shelby, severely eroded	 20 	 Very limited Slow water movement	 1.00 	 Very limited Slope Seepage	 1.00 0.05
470D2: Lamoni, moderately eroded	 40 	Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
Shelby, moderately eroded	 35 	 Very limited Slow water movement Slope	 1.00 0.63	 Very limited Slope Seepage	 1.00 0.05
545B: Zook	 35 	Very limited Slow water movement Depth to saturated zone	 1.00 1.00	 Very limited Depth to saturated zone Slope	 1.00 0.32
Ely	 30 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.95	 Very limited Depth to saturated zone Slope Seepage	 1.00 0.32 0.05
Gullied land	 20 	 Not rated 	 	 Not rated 	
569C: Nira	 45 	 Very limited Depth to saturated zone Slow water movement	 1.00 0.95	 Very limited Depth to saturated zone Slope Seepage	 1.00 1.00 0.05
Clearfield	35 	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 0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	absorption fiel	ds	Sewage lagoons 	
		Rating class and limiting features	Value	Rating class and limiting features	Value
579E3: Bucknell, severely eroded	 55 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00	Very limited Slope Depth to saturated zone	 1.00 1.00
Hedrick, severely eroded	 35 	Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 	 Very limited Slope Depth to saturated zone Seepage	 1.00 1.00 0.05
794C2: Armstrong, moderately eroded	 65 	 Very limited Slow water movement Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone	 1.00 1.00
Ladoga, moderately eroded	 30 	 Very limited Slow water movement Depth to saturated zone	 1.00 0.99	 Very limited Slope Depth to saturated zone Seepage	 1.00 0.71 0.05
822D2: Lamoni, moderately eroded	 55 	 Very limited Slow water movement Depth to saturated zone Slope	 1.00 1.00 0.63	 Very limited Slope Depth to saturated zone	 1.00 1.00
870B: Sharpsburg, terrace	 85 	 Very limited Slow water movement Depth to saturated zone	 1.00 0.99	Somewhat limited Depth to saturated zone Slope Seepage	 0.71 0.08 0.05
870C2: Sharpsburg, terrace, moderately eroded		 Very limited Slow water movement Depth to saturated zone	 1.00 0.99	 	 1.00 0.71 0.05

Sewage Disposal--Continued

Map symbol and soil name	Pct. of	Septic tank absorption fiel	ds	Sewage lagoons	
	map				
	unit				
	 	Rating class and limiting features	Value	Rating class and limiting features	Value
870D2:	 	 		 	
Sharpsburg, terrace,	i	İ	i	İ	i
moderately eroded	75	Very limited	İ	Very limited	i
_	İ	Slow water	1.00	Slope	1.00
	İ	movement	İ	Depth to	0.71
	ĺ	Depth to	0.99	saturated zone	İ
		saturated zone		Seepage	0.05
	 	Slope	0.63	 	
876B:					
Ladoga, terrace	100			Somewhat limited	!
		Slow water	1.00	Depth to	0.71
	 	movement		saturated zone	
	 	Depth to saturated zone	0.99	Slope Seepage	0.08
		sacuraced zone		Beepage	
876C2:					
Ladoga, terrace, moderately eroded	 70	 Very limited		 Very limited	1
moderatery eroded	, 0 	Slow water	1.00	Slope	1.00
		movement		Depth to	0.71
		Depth to	0.99	saturated zone	
	į	saturated zone	į	Seepage	0.05
876D2:	 	 		 	
Ladoga, terrace,			i		i
moderately eroded	75	 Very limited	i	 Very limited	i
	İ	Slow water	1.00	Slope	1.00
		movement		Depth to	0.71
		Depth to	0.99	saturated zone	
		saturated zone		Seepage	0.05
	 	Slope 	0.63	 	
2368B:					į
Macksburg	70	Very limited		Very limited	
	 	Depth to	1.00	Depth to	1.00
	 	saturated zone Slow water	1.00	saturated zone	0.32
	 	movement		Seepage	0.05
	į		į		į
Nira	25	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
	 	Slow water movement	0.95	Slope Seepage	0.32
E020.					
5030: Pits, limestone	l I	 		 	1
quarries	1100	 Not rated		 Not rated	1
40077769	=00				
5040:	İ		i	İ	i
Udorthents, loamy	100	Not rated	į	Not rated	į
5041:	 	 		 	
] 		 	1
IIdorthente					
Udorthents, reclaimed	 100	 Not rated		 Not rated	i

Sewage Disposal--Continued

Map symbol	Pct.	Septic tank		Sewage lagoons	3
and soil name	of	absorption fiel	ds		
	map	į -		İ	
	unit	j		İ	
		Rating class and	Value	Rating class and	Value
	1	limiting features		limiting features	
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	landfill	У	Area sanitary landfill		Daily cover fo	or
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7:							
Wiota, rarely		 	l I		i	I I	1
flooded	85	 Verv limited		 Very limited	i		1
1100404	03	Depth to	1.00	· -	1.00		0.50
	i	saturated zone		saturated zone			
	i	Too clayey	0.50	Flooding	0.40		i
		Flooding	0.40				į
Ъ:				 		 	
Wiota, rarely		 	1		1	I I	1
flooded	 85	 Very limited		 Very limited	1	 Somewhat limited	1
1100ded	03	Depth to	1.00	-	1.00		0.50
		saturated zone	1	saturated zone	1	100 014/07	1
		Too clayey	0.50	Flooding	0.40	 	1
		Flooding	0.40				
BB:		l					
Judson	 0 5	 Comowhat limited		 Not limited		 Somewhat limited	-
Judson	65	Too clayey	0.50	Not illilited	1	Too clayey	0.50
		100 clayey				100 Clayey	
5B:	į		į	į	į	į	į
Olmitz	35	_	1	Very limited	1	Somewhat limited	!
		Depth to	1.00		1.00	Too clayey	0.50
		saturated zone		saturated zone	!	!	!
		Too clayey	0.50	 		 	
Ely	30	 Very limited		 Very limited	İ	 Very limited	i
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Too clayey	0.50			Too clayey	0.50
Zook	20	 Very limited		 Very limited		 Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
.6:						 	
Nodaway,	į i		İ	İ	İ	İ	İ
occasionally	į i	İ	İ	İ	İ	İ	İ
flooded	55	Very limited	İ	Very limited	i	Somewhat limited	i
	į i	Flooding	1.00	Flooding	1.00	Too clayey	0.50
	į i	Depth to	1.00	Depth to	1.00	İ	İ
	į i	saturated zone	İ	saturated zone	İ	İ	İ
	į	Too clayey	0.50	į	į	į	į
Kennebec,		 		 	 	 	
occasionally			1	İ	i		i
flooded	35	 Very limited	1	 Very limited	i	Somewhat limited	i
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to	1.00	Depth to	1.00		
		saturated zone		saturated zone			i
	!		1		!	!	1

Map symbol and soil name	Pct. of map unit	landfill	У	Area sanitary landfill	•	Daily cover fo	or
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	 Rating class and limiting features	Value
24C2: Shelby, moderately eroded	 85 	 Somewhat limited Too clayey	 0.50	 Not limited 		 Somewhat limited Too clayey	 0.50
24D2: Shelby, moderately eroded	 70 	 Somewhat limited Slope Too clayey	 0.63 0.50	 Somewhat limited Slope	 0.63	 Somewhat limited Slope Too clayey	0.63
24E: Shelby	 60 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	1.00	 Very limited Slope Too clayey	 1.00 0.50
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope	 1.00	 Very limited Slope Too clayey	 1.00 0.50
24F: Shelby	 65 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	 1.00	 Very limited Slope Too clayey	 1.00 0.50
43: Bremer, rarely flooded	 85 	 Very limited Depth to saturated zone Too clayey Flooding	 1.00 0.50 0.40	Uery limited Depth to saturated zone Flooding	 1.00 0.40	Very limited Depth to saturated zone Hard to compact Too clayey	 1.00 1.00 0.50
45B: Zook	 75 	 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 Hard to compact Too clayey	 1.00 1.00 0.50
Ely	 20 	 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
54: Zook, occasionally flooded	90	 - Very limited Flooding Depth to saturated zone Too clayey	 1.00 1.00 0.50	 - Very limited Flooding Depth to saturated zone	 1.00 1.00	 	 1.00 1.00 0.50

Map symbol and soil name	Pct. of map	Trench sanitar	У	Area sanitary		Daily cover fo	or
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Valu
54+: Zook, occasionally flooded, overwash	 80	 Very limited		 Very limited		 Very limited	
rioded, Overwan		Flooding Depth to saturated zone	1.00	Flooding Depth to saturated zone	1.00	Depth to saturated zone Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
76B: Ladoga	 95 	Depth to	 1.00	 Very limited Depth to	 1.00	 Somewhat limited Too clayey	 0.50
	 	saturated zone Too clayey	0.50	saturated zone	 	 	
76C: Ladoga	 75	 Very limited		 Very limited		 Very limited	
	 	Depth to saturated zone Too clayey	1.00 0.50	Depth to saturated zone	1.00 	Hard to compact Too clayey	1.00 0.50
76D: Ladoga	 85	 Very limited	 	 Very limited	 	 Somewhat limited	
-	 	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope Too clayey	0.63
	 	Too clayey	0.50	blope 		 	
76D2: Ladoga, moderately eroded		 Very limited		 Very limited		 Somewhat limited	
eroded	00	Depth to saturated zone Slope	1.00	Depth to saturated zone Slope	1.00	Slope Too clayey	0.63
	<u> </u> 	Too clayey	0.50				İ
<pre>86: Mt. Sterling, occasionally</pre>	 	 	 	 	 	 	
flooded	60 	Very limited Flooding Depth to	 1.00 1.00	Very limited Flooding Depth to	 1.00 1.00	Very limited Depth to saturated zone	1.00
	 	saturated zone	0.50	saturated zone	 	Hard to compact Too clayey	1.00
Zook, occasionally flooded, overwash	25	 Very limited Flooding	1.00	 Very limited Flooding	1.00	 Very limited Depth to	1.00
	 	Depth to saturated zone Too clayey	1.00 1.00 0.50	Proburing Depth to saturated zone	1.00	saturated zone Hard to compact Too clayey	1.00 1.00 0.50
88: Nevin, rarely	 	 		 		 	
flooded	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
	 	Too clayey	0.50	Flooding	0.40	Too clayey	0.50

Map symbol and soil name	Pct. of map unit	landfill	У	Area sanitary landfill 		Daily cover fo landfill	or
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93D2: Shelby, moderately eroded	 35 	 - Somewhat limited Slope Too clayey	 0.63 0.50	 Somewhat limited Slope 	 0.63	 - Somewhat limited Slope Too clayey	0.63
Adair, moderately eroded	 25 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50
93E2: Shelby, moderately eroded	 45 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	 1.00 	 Very limited Slope Too clayey	 1.00 0.50
Adair, moderately eroded	 30 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 1.00 0.50	 Very limited Depth to saturated zone Slope	 1.00 1.00	 Very limited Depth to saturated zone Slope Too clayey	 1.00 1.00 0.50
172: Wabash, frequently ponded, occasionally flooded	 90	 	 1.00 1.00	 - - Very limited Flooding Depth to saturated zone Ponding	 1.00 1.00	 	 1.00 1.00
179E: Gara	 60 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	 1.00	 Very limited Slope Too clayey	 1.00 0.50
179F: Gara	 65 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	 1.00	 Very limited Slope Too clayey	 1.00 0.50
179G: Gara	 70 	 Very limited Slope Too clayey	1.00	 Very limited Slope 	 1.00	 Very limited Slope Too clayey	 1.00 0.50
192D2: Adair, moderately eroded	 55 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 - Very limited Depth to saturated zone Slope 	 1.00 0.63	Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50

Landfills--Continued

and soil name 	Pct. of map unit	Trench sanitar landfill 	У	Area sanitary landfill	•	Daily cover for landfill	
	unit	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220: Nodaway, occasionally	 	 	 	 	 	 	
flooded	80 	Very limited Flooding Depth to saturated zone Too clayey	 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	 1.00 1.00 	Somewhat limited Too clayey	 0.50
222C2: Clarinda, moderately eroded	 75	 -	 	 		 -	
eroded	/s 	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
222D: Clarinda	 75 	 Very limited Depth to saturated zone Too clayey	 1.00 1.00	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Very limited Depth to saturated zone Too clayey	 1.00 1.00
222D2:	 	Slope 	0.63	 		Hard to compact	1.00
Clarinda, moderately eroded	'	 Very limited Depth to saturated zone Too clayey Slope	 1.00 1.00 0.63	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Very limited Depth to saturated zone Too clayey Hard to compact	 1.00 1.00 1.00
222D3: Clarinda, severely eroded	 70 	 - Very limited Depth to saturated zone Too clayey	 1.00 1.00	 - Very limited Depth to saturated zone Slope	 1.00 0.63	 - Very limited Depth to saturated zone Too clayey	 1.00 1.00
248: Wabash, occasionally	 	Slope -	0.63 	 		Hard to compact 	1.00
ponded, occasionally flooded	 85 	 Very limited Flooding Depth to saturated zone Too clayey	 1.00 1.00 1.00	 Very limited Flooding Depth to saturated zone Ponding	 	 Very limited Depth to saturated zone Too clayey Hard to compact	 1.00 1.00 1.00
269: Humeston, occasionally flooded	 100 	 	 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

	Pct. of map unit	landfill	У	Area sanitary landfill 		Daily cover fo landfill	or
	 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
273B: Olmitz	 80 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Too clayey 	 0.50
273C: Olmitz	 75 	Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	 Somewhat limited Too clayey 	 0.50
324C2: Dickman, moderately eroded	 90 	! -	 1.00 0.50	 Very limited Seepage 	 1.00	 Very limited Seepage Too sandy	 1.00 0.50
324D2: Dickman, moderately eroded	 90 	 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
354: Aquolls, ponded	 100 	 Not rated 	 	 Very limited Depth to saturated zone Ponding	 1.00 1.00	 Not rated 	
368: Macksburg	 85 	 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
369: Winterset	 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 Hard to compact Too clayey	 1.00 1.00 0.50
370: Sharpsburg	 95 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	 Somewhat limited Too clayey 	 0.50
370B: Sharpsburg	95 95 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	 Somewhat limited Too clayey 	0.50

Map symbol and soil name	Pct. of map unit	landfill	У	Area sanitary landfill 		Daily cover fo	or
		Rating class and	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
371C2: Sharpsburg, moderately eroded	 35 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 - Very limited Depth to saturated zone 	 1.00	 Somewhat limited Too clayey 	 0.50
Nira, moderately eroded	 30 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	Somewhat limited Depth to saturated zone Too clayey	0.86
371D2: Sharpsburg, moderately eroded	 50 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Somewhat limited Slope Too clayey	 0.63 0.50
Nira, moderately eroded	 20 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 Very limited Depth to saturated zone Slope	 1.00 0.63	Somewhat limited Depth to saturated zone Slope Too clayey	0.86
421C2: Gara, moderately eroded	 35	 Somewhat limited Too clayey	 0.50	 Not limited 	 	 Somewhat limited Too clayey	
Bucknell, moderately eroded		 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
421D2: Gara, moderately eroded	 35 	 Somewhat limited Slope Too clayey	 0.63 0.50	 Somewhat limited Slope 	 0.63 	 Somewhat limited Slope Too clayey	0.63
Bucknell, moderately eroded		 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50
421E2: Gara, moderately eroded	 40 	 Very limited Slope Too clayey	 1.00 0.50	 Very limited Slope 	 1.00	 - Very limited Slope Too clayey	 1.00 0.50

Map symbol and soil name	Pct. of map unit	Trench sanitar	У	Area sanitary landfill		Daily cover fo landfill	or
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421E2: Bucknell, moderately eroded		 Very limited	 	 Very limited	 	 Very limited	
croaca	23	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	 	Slope Too clayey	1.00	Slope 		Slope Too clayey	1.00
435: Zook, occasionally flooded		 -		 -		 	
1100ded	40 	Very limited Flooding Depth to	1.00	Very limited Flooding Depth to	1.00	Very limited Depth to saturated zone	1.00
	 	saturated zone	0.50	saturated zone		Hard to compact Too clayey	1.00
Mt. Sterling, occasionally	 		 				
flooded	35 	Very limited Flooding Depth to	 1.00 1.00	Very limited Flooding Depth to	 1.00 1.00	Very limited Depth to saturated zone	1.00
	 	saturated zone Too clayey	 0.50	saturated zone		Hard to compact Too clayey	1.00
469C2: Lamoni, moderately	 		 	 		 	
eroded	35 	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
Clarinda, moderately		loo clayey Very limited		 Very limited			
eroueu	30	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	 	Too clayey 	1.00 	 	 	Too clayey Hard to compact	1.00 1.00
Shelby, moderately eroded	 20 	 Somewhat limited Too clayey	0.50	 Not limited 	 	 Somewhat limited Too clayey	0.50
469C3: Lamoni, severely	 	 	 	 		 	
eroded	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
	<u> </u> 	Too clayey	0.50	 	İ	Too clayey	0.50
Clarinda, severely eroded	 30 	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to saturated zone	 1.00
	 	Too clayey	1.00	 	<u> </u> 	Too clayey Hard to compact	1.00
Shelby, severely eroded	 20 	 Somewhat limited Too clayey	 0.50	 Not limited 	 	 Somewhat limited Too clayey	 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	landfill	У	Area sanitary landfill 		Daily cover for landfill	or
	<u> </u> 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
470D2: Lamoni, moderately	 	 	 	 	 	 	
eroded	40	 Very limited		 Very limited		 Very limited	i
		Depth to	1.00	Depth to	1.00	· -	1.00
	i	saturated zone		saturated zone		saturated zone	
	į	Slope	0.63	Slope	0.63	Slope	0.63
	į	Too clayey	0.50		į	Too clayey	0.50
61 - 11 1 t - 1							
Shelby, moderately eroded	25	 Compatibat limited		 Somewhat limited		 Somewhat limited	
eroded	35	Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50	blobe		Too clayey	0.50
	i				i		
545B:	į	j	j	j	į	İ	į
Zook	35	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00		1.00
		saturated zone		saturated zone		saturated zone	
		Too clayey	0.50			Hard to compact	1.00
		 		 	I	Too clayey	0.50
Ely	30	 Verv limited		 Very limited		 Very limited	i
1		Depth to	1.00	Depth to	1.00	: -	1.00
	i	saturated zone	i	saturated zone	i	saturated zone	i
	İ	Too clayey	0.50	İ	Ì	Too clayey	0.50
Gullied land	20	 Not rated		 Not rated		 Not rated	
569C:							ļ
Nira	45	· -		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
		Too clayey	0.50	saturated zone		Too clayey	0.50
	i				i		
Clearfield	35	Very limited	i	Very limited	i	 Very limited	i
	į	Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Too clayey	0.50		1	Hard to compact	1.00
						Too clayey	0.50
579E3:		 		 		 	
Bucknell, severely				 		 	i
eroded	55	 Very limited	i	 Very limited	İ	 Very limited	i
	į	Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Hedrick, severely		 		 		 	
eroded	35	 Very limited		 Very limited		 Very limited	
02000		Depth to	1.00	Depth to	1.00		1.00
	į	saturated zone	į	saturated zone	į	Depth to	0.86
		Slope	1.00	Slope	1.00	saturated zone	
	ļ	Too clayey	0.50		1	Too clayey	0.50
E0460					1		
794C2:		 		 	1	 	1
Armstrong, moderately eroded	 65	 Verv limited		 Very limited		 Very limited	1
Judiacory eroued		Depth to	1.00	Depth to	1.00		1.00
	i	saturated zone		saturated zone		saturated zone	i
	İ	Too clayey	0.50	į	į	Too clayey	0.50
	i		i	į	i		i

Map symbol and soil name	Pct. of map unit	landfill	У	Area sanitary landfill 		Daily cover fo landfill	or
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
794C2: Ladoga, moderately eroded	 30 	Very limited Depth to saturated zone Too clayey	 1.00 0.50	Very limited Depth to saturated zone	 1.00	 Somewhat limited Too clayey 	 0.50
822D2: Lamoni, moderately eroded	 55 	 	 1.00 0.63 0.50	Very limited Depth to saturated zone Slope	 1.00 0.63	 	 1.00 0.63 0.50
870B: Sharpsburg, terrace	 85 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	 Somewhat limited Too clayey 	0.50
870C2: Sharpsburg, terrace, moderately eroded	1	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 - Very limited Depth to saturated zone 	 1.00 	 - Somewhat limited Too clayey -	 0.50
870D2: Sharpsburg, terrace, moderately eroded	1	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	 Very limited Depth to saturated zone Slope	 1.00 0.63	 Somewhat limited Slope Too clayey	0.63
876B: Ladoga, terrace	 100 	 Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone	 1.00 	 Somewhat limited Too clayey 	 0.50
876C2: Ladoga, terrace, moderately eroded	 70 	Very limited Depth to saturated zone Too clayey	 1.00 0.50	 Very limited Depth to saturated zone 	 1.00	 Somewhat limited Too clayey 	 0.50
876D2: Ladoga, terrace, moderately eroded	 75 	 Very limited Depth to saturated zone Slope Too clayey	 1.00 0.63 0.50	Very limited Depth to saturated zone Slope	 1.00 0.63	 Somewhat limited Slope Too clayey 	0.63

Map symbol	Pct.	Trench sanitar	У	Area sanitary		Daily cover fo	r
and soil name	of	landfill		landfill	landfill		
	map unit	 				 	
		Rating class and	Value	Rating class and	Value	Rating class and	Value
	<u> </u>	limiting features		limiting features		limiting features	<u> </u>
2368B:				 			
Macksburg	70	 Very limited	i	 Very limited	i	 Very limited	i
_	i	Depth to	1.00	Depth to	1.00	Depth to	1.00
	İ	saturated zone	İ	saturated zone	İ	saturated zone	i
	į	Too clayey	0.50		į	Too clayey	0.50
Nira	25	 Very limited		 Very limited		 Somewhat limited	1
	i	Depth to	1.00	Depth to	1.00	Depth to	0.86
	i	saturated zone		saturated zone		saturated zone	
	i	Too clayey	0.50		i	Too clayey	0.50
	i				i		1
5030:	į		į		į		İ
Pits, limestone							
quarries	100	Not rated		Not rated		Not rated	
5040:				 			
Udorthents, loamy	100	Not rated	İ	Not rated	į	Not rated	j
5041:		l				l	
Udorthents,	l I	 		 		 	1
reclaimed	1100	Not rated		Not rated		Not rated	1
reclaimed	1	NOC Taced		NOC Taced		NOC Faced 	
AW:				 	i		i
Animal waste lagoon	100	Not rated	İ	Not rated	i	Not rated	i
	ĺ		İ		ĺ		ĺ
SL:							
Sewage lagoon	100	Not rated	[Not rated		Not rated	
					ļ		
W:		 		 	ļ	 	ļ
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	!	rce	Potential as source of sand		
	unit			<u> </u>		
	<u> </u>	Rating class	Value	Rating class	Value	
7:	 					
Wiota, rarely	į		į		i	
flooded	85	Improbable		Poor		
		Thickest layer	0.00		0.00	
		Bottom layer	0.00	Thickest layer	0.00	
7B:				 	İ	
Wiota, rarely	İ		İ		i	
flooded	85	Improbable	į	Poor	j	
		Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
8B:	 			 		
Judson	85	Improbable	İ	Poor	i	
	į	Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
15B:		 		 	l	
Olmitz	35	 Improbable		Poor	i	
		Thickest layer	1	Bottom layer	0.00	
	į	Bottom layer	0.00	Thickest layer	0.00	
Ely	 30	 Improbable		 Poor	l I	
2		Thickest layer	'	Bottom layer	0.00	
	İ	Bottom layer	0.00		0.00	
Zook		 Tmpmobable		 Poor	ļ	
200K	20	Thickest layer	0.00	1	0.00	
		Bottom layer	0.00	<u>-</u>	0.00	
1.0					ļ	
16: Nodaway,	 	 		 	ŀ	
occasionally				 	i	
flooded	55	Improbable	i	Poor	i	
	į	Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
Kennebec,	 	 		 	l I	
occasionally				 	i	
flooded	35	Improbable	İ	Poor	i	
	i	Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
24C2:	 	 		 		
Shelby, moderately					i	
eroded	85	Improbable		Poor	İ	
		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	Potential as so of gravel	urce	Potential as so of sand	urce
	unit	 			
	<u> </u>	Rating class	Value	Rating class	Value
24D2: Shelby, moderately	 	 		 	
eroded	70	Improbable		Poor	i
	į	Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
24E:		 		l Doom	
Shelby	60	Improbable Thickest layer	0.00	Poor Bottom layer	0.00
		Bottom layer	0.00	<u>-</u>	0.00
24E2:		 		 	
Shelby, moderately					
eroded	65	Improbable		Poor	
		Thickest layer	0.00	<u>-</u>	0.00
		Bottom layer 	0.00	Thickest layer 	0.00
24F:					-
Shelby	65	Improbable Thickest layer	0.00	Poor Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
43:		 			
Bremer, rarely	ĺ		İ		İ
flooded	85	: -		Poor	
		Thickest layer	0.00	<u>-</u>	0.00
		Bottom layer	0.00	Thickest layer 	0.00
45B:					
Zook	75	Improbable	0.00	Poor	0.00
		Thickest layer Bottom layer	0.00	Bottom layer Thickest layer	0.00
p1	20	Twamahahla		 Poor	
Ely	20	Improbable Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
54:		 		 	
Zook, occasionally			ļ		ļ
flooded	90	Improbable	0.00	Poor	
		Thickest layer Bottom layer	0.00	Bottom layer Thickest layer	0.00
54+:		 			
Zook, occasionally	İ	j	j		į
flooded, overwash	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer 	0.00
76B: Ladoga	95	 Improbable		 Poor	
-	į	Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
76C:					
Ladoga	75	Improbable		Poor	
	1	Thickest layer Bottom layer	0.00	Bottom layer Thickest layer	0.00
	1	Doctom rayer	10.00	Interest rayer	10.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map	!	urce	Potential as so of sand	urce	
	unit					
		Rating class	Value	Rating class	Value	
76D:	 	 			l I	
Ladoga	85 	Improbable Thickest layer Bottom layer	0.00	Poor Bottom layer Thickest layer	0.00	
76D2:	 	 		 		
Ladoga, moderately eroded	 60 	 Improbable Thickest layer Bottom layer	0.00	<u>-</u>	0.00	
86:	 	 		 		
Mt. Sterling, occasionally flooded	 60	 Improbable Thickest layer		 Poor Bottom layer	 0.00	
		Bottom layer	0.00		0.00	
Zook, occasionally	 	 		 		
flooded, overwash	25	 Improbable		Poor		
	 	Thickest layer Bottom layer 	0.00 0.00 	<u>-</u>	0.00	
88:	į	 -	į	 -	į	
Nevin, rarely flooded	 90 	 Improbable Thickest layer Bottom layer	0.00	<u>-</u>	0.00	
93D2: Shelby, moderately eroded	 35 	 Improbable Thickest layer Bottom layer	0.00	<u>-</u>	0.00	
Adair, moderately						
eroded	25 	Improbable Thickest layer Bottom layer	0.00	<u>-</u>	0.00	
93E2:					į	
Shelby, moderately eroded	 45 	 Improbable Thickest layer	 0.00	 Poor Bottom layer	 0.00	
	į	Bottom layer	0.00		0.00	
Adair, moderately eroded	 30	 Improbable		 Poor Bottom layer		
		Thickest layer Bottom layer	0.00	Thickest layer	0.00	
172: Wabash, frequently ponded, occasionally	 	 		 		
flooded	90	Improbable Thickest layer	0.00	<u>-</u>	0.00	
		Bottom layer	0.00	Thickest layer	0.00	

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map	of gravel		Potential as source of sand		
	unit					
	<u> </u>	Rating class	Value	Rating class	Value	
179E:	 	l		l		
Gara	 60 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
179F:	 	l		l I		
Gara	 65 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
179G:	 	 		 		
Gara	70 	 Thickest layer Bottom layer	0.00	· -	0.00	
192D2: Adair, moderately eroded	 55 	 Improbable Thickest layer Bottom layer	0.00		0.00	
220:	 	 		 		
Nodaway, occasionally flooded	 80 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
222C2:	 	 		 		
Clarinda, moderately eroded		 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
222D:	 	 		 		
Clarinda	75 	Improbable Thickest layer Bottom layer	0.00		0.00	
222D2:	 	 		 		
Clarinda, moderately eroded	,	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
222D3:	 	[1	 		
Clarinda, severely eroded	70 70	 Improbable Thickest layer Bottom layer	 0.00 0.00	 Poor Bottom layer Thickest layer	 0.00 0.00	
248: Wabash, occasionally ponded, occasionally	 	 	 	 		
flooded	 85 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map	Potential as so of gravel	urce	Potential as source of sand		
	unit	Rating class	Value	Rating class	Value	
		Racing class		Racing class		
269: Humeston, occasionally flooded	 100 	 Improbable Thickest layer Bottom layer	 0.00	· -	 0.00 0.00	
	İ				İ	
273B: Olmitz	 80 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer 	0.00	
273C: Olmitz	 75 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
324C2: Dickman, moderately eroded	 90 	 Improbable Thickest layer Bottom layer	0.00	-	0.00	
324D2: Dickman, moderately eroded	 90 	 Improbable Thickest layer Bottom layer	0.00	· -	 0.00 0.07	
354: Aquolls, ponded	 100	 Not rated		 Not rated		
368: Macksburg	 85 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
369: Winterset	 100 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
370: Sharpsburg	 95 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
370B: Sharpsburg	 95 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
371C2: Sharpsburg, moderately eroded	 35 	 Improbable Thickest layer Bottom layer	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			Potential as source of sand		
	unit	!		Rating class Valu		
	<u> </u>	Rating class	Value	Rating class	Value	
371C2: Nira, moderately eroded	 30 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
371D2:	 	 	l	 	l I	
Sharpsburg, moderately eroded	 50 	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
Nira, moderately eroded	 20 	 Improbable Thickest layer Bottom layer	0.00		0.00	
421C2: Gara, moderately eroded	 35	 Improbable Thickest layer Bottom layer	 0.00 0.00	· -	0.00	
Bucknell, moderately eroded		- 	į	 Poor Bottom layer	 0.00 0.00	
421D2: Gara, moderately eroded	 35 	 Improbable Thickest layer Bottom layer	 0.00 0.00	· -	 0.00 0.00	
Bucknell, moderately eroded		 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
421E2: Gara, moderately eroded	 40 	 Improbable Thickest layer Bottom layer	0.00		0.00	
Bucknell, moderately eroded	:	 Improbable Thickest layer Bottom layer	0.00	· -	0.00	
435: Zook, occasionally flooded	 40 	 Improbable Thickest layer Bottom layer	 0.00 0.00	 Poor Bottom layer Thickest layer	0.00	
Mt. Sterling, occasionally flooded	 35 	 Improbable Thickest layer Bottom layer	 0.00 0.00	 Poor Bottom layer Thickest layer	0.00	

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of	Potential as so of gravel	urce	Potential as source of sand		
	map					
	unit 	 Rating class	Value	Rating class	Value	
		Ī	İ	ĺ	İ	
469C2:						
Lamoni, moderately eroded	 35	 Improbable		 Poor	-	
eroueu	33	Thickest layer	0.00	!	0.00	
	į	Bottom layer	0.00	Thickest layer	0.00	
Clarinda, moderately	 			 		
eroded	30	Improbable	İ	Poor	ĺ	
		Thickest layer	0.00	Bottom layer	0.00	
	 	Bottom layer	0.00	Thickest layer	0.00	
Shelby, moderately					į	
eroded	20	Improbable		Poor		
	 	Thickest layer Bottom layer	0.00	Bottom layer Thickest layer	0.00	
		Boccom Tayer		Interest Tayer		
469C3: Lamoni, severely	 	 		 		
eroded	 35	 Improbable		Poor	i	
	İ	Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
Clarinda, severely		 		 		
eroded	30	Improbable		Poor		
		Thickest layer	0.00	· -	0.00	
	 	Bottom layer 	0.00	Thickest layer 	0.00	
Shelby, severely					į	
eroded	20	Improbable Thickest layer	0.00	Poor Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
470D2:	 	 		 		
Lamoni, moderately			i	<u> </u>	i	
eroded	40	Improbable	j	Poor	j	
		Thickest layer	0.00		0.00	
	 	Bottom layer 	0.00	Thickest layer	0.00	
Shelby, moderately		<u> </u>	į	<u> </u>	į	
eroded	35	Improbable Thickest layer	0.00	Poor Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
545B:	 	 		 		
Zook	35	Improbable	i	Poor	i	
	ĺ	Thickest layer	0.00	Bottom layer	0.00	
	 	Bottom layer	0.00	Thickest layer	0.00	
Ely	30	Improbable		Poor		
		Thickest layer	0.00	· -	0.00	
	 	Bottom layer 	0.00	Thickest layer 	0.00	
Gullied land	20	Not rated		Not rated		
569C:	 	 		 		
Nira	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	Potential as so of gravel	urce	Potential as source of sand		
	unit 	Rating class	Value	Rating class	Value	
			i		1	
569C: Clearfield	 35 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	 0.00 0.00	
579E3: Bucknell, severely eroded	 55	 Improbable Thickest layer	 0.00	 Poor Bottom layer	 0.00	
	 	Bottom layer	0.00	Thickest layer	0.00	
Hedrick, severely eroded	 35 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
794C2:	 	 		 		
Armstrong, moderately eroded	 65 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
Ladoga, moderately eroded	 30 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
822D2: Lamoni, moderately eroded	 55 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
870B: Sharpsburg, terrace	 85 	 Improbable Thickest layer Bottom layer	 0.00 0.00	 Poor Bottom layer Thickest layer	 0.00 0.00	
870C2: Sharpsburg, terrace,	 	Bottom rayer 		Infokest Tayer 		
moderately eroded	85 	Improbable Thickest layer Bottom layer 	0.00	Poor Bottom layer Thickest layer 	 0.00 0.00	
870D2: Sharpsburg, terrace, moderately eroded	 75 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	 0.00 0.00	
876B: Ladoga, terrace	 100 	 Improbable Thickest layer Bottom layer	0.00	 Poor Bottom layer Thickest layer	0.00	
876C2: Ladoga, terrace, moderately eroded	 70 	 Improbable Thickest layer Bottom layer	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	Potential as so of gravel	urce	Potential as source of sand		
	unit			 		
	<u> </u>	Rating class	Value	Rating class	Value	
876D2:		 		 	i	
Ladoga, terrace,	i		i		i	
moderately eroded	75	Improbable	i	Poor	i	
-	i	Thickest layer	0.00	Bottom layer	0.00	
	į	Bottom layer	0.00	Thickest layer	0.00	
2368B:						
Macksburg	70	Improbable		Poor		
		Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
Nira	 25	 Improbable	l I	 Poor	l	
NII	23	Thickest layer	0.00	Bottom layer	0.00	
		Bottom layer	0.00	Thickest layer	0.00	
		200000111 24701				
5030:	İ		i		i	
Pits, limestone	İ	İ	i		i	
quarries	100	Not rated	j	Not rated	į	
5040:						
Udorthents, loamy	100	Not rated		Not rated		
					ļ	
5041:					-	
Udorthents, reclaimed	1100			 Not rated		
reclaimed	1	NOT rated 		NOT rated 		
AW:		 		 		
Animal waste lagoon	100	Not rated		Not rated	i	
					i	
SL:	İ		i		i	
Sewage lagoon	100	Not rated	j	Not rated	į	
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	reclamation material		Potential as sou 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
7: Wiota, rarely flooded	 85 	 Fair Too acid Water erosion	 0.84 0.90		 0.00 0.87	Good	
7B: Wiota, rarely flooded	 85 	 - Fair Too acid Water erosion	 0.84 0.90		 0.00 0.87	Good	
8B: Judson	 85 	 Fair Organic matter content Water erosion	0.50	 Poor Low strength Shrink-swell	 0.00 0.87	Good	
15B: Olmitz	 35 	 Fair Too acid 	 0.97	 Poor Low strength Shrink-swell	 0.00 0.87	Good	
Ely	 30 	 Fair Water erosion 	 0.90 	 Poor Wetness Low strength Shrink-swell	 0.00 0.00 0.87	Poor Wetness	 0.00
Zook	 20 	 Too clayey Too acid	 0.00 0.97		 0.00 0.00 0.25	Poor Wetness Too clayey	 0.00 0.00
16: Nodaway, occasionally flooded	 55 	 - Fair Organic matter content Water erosion	 0.12 0.37	 - Poor Low strength Shrink-swell	 0.00 0.87	Good	
Kennebec, occasionally flooded	 35 	 Fair Water erosion 	 0.90	 - Poor Low strength Shrink-swell	 0.00 0.87	Good	
24C2: Shelby, moderately eroded	 85 	 - Fair Organic matter content Too clayey Too acid	 0.50 0.68 0.97	 Fair Shrink-swell 	 0.87 	Fair Too clayey Rock fragments	 0.44 0.95

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	irce
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
24D2:				 		 	
Shelby, moderately	i				i		i
eroded	70	Fair	i	Fair	i	Fair	i
	i	Organic matter	0.50	Shrink-swell	0.87	Slope	0.37
	i	content	i		i	Too clayey	0.44
	İ	Too clayey	0.68	İ	İ	Rock fragments	0.95
	į	Too acid	0.97	į	į		į
24E:		[
Shelby	60	Fair	İ	Fair	İ	Poor	İ
	İ	Organic matter	0.50	Shrink-swell	0.87	Slope	0.00
		content		Slope	0.98	Too clayey	0.44
		Too clayey	0.68			Rock fragments	0.95
		Too acid	0.97				
24E2:		 				 	
Shelby, moderately eroded	65	Fair	I	 Fair	1	Poor	1
eroded	05	Organic matter	0.50	Shrink-swell	0.87		0.00
	i	content		Slope	0.98	Too clayey	0.44
	i	Too clayey	0.68			Rock fragments	0.95
	į	Too acid	0.97	į	į		
24F:						 	
Shelby	65	Fair	i	Fair	i	Poor	i
-	İ	Organic matter	0.50	Slope	0.18	Slope	0.00
	İ	content	İ	Shrink-swell	0.87	Too clayey	0.44
	İ	Too clayey	0.68	İ	İ	Rock fragments	0.95
		Too acid	0.97				
43:						 	
Bremer, rarely							
flooded	85	Fair		Poor		Poor	
		Too clayey	0.01	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Low strength	0.00	Too clayey	0.00
				Shrink-swell	0.69	 	
45B:	į				į		į
Zook	75	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
		 		Shrink-swell	0.25	 	
Ely	20	1		Poor	İ	Poor	İ
		Water erosion	0.90	· ·	0.00	Wetness	0.00
				Low strength Shrink-swell	0.00	l I	
				Switzen Sweit			
54: Zook, occasionally				 		l I	
flooded	90	Poor		Poor	1	Poor	i
		Too clayey	0.00	!	0.00		0.00
		Too acid	0.00		0.00	Too clayey	0.00
	<u> </u>			Shrink-swell	0.25		
	i	İ	į	İ	i	į	i

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	irce	Potential as sou of topsoil	irce
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54+: Zook, occasionally	 	 	 	 	 	 	
flooded, overwash	80 	Fair Too clayey Water erosion 	 0.12 0.68	Poor Wetness Low strength Shrink-swell	 0.00 0.00 0.17	Poor Wetness Too clayey	 0.00 0.12
76B:	 	 		 		 	
Ladoga	95 	Fair Too clayey Water erosion Too acid	 0.08 0.37 0.74	Poor Low strength Shrink-swell 	 0.00 0.28 	Fair Too clayey 	 0.06
76C: Ladoga	 75 	 Fair Too clayey Water erosion Too acid	 0.08 0.37 0.74	 Poor Low strength Shrink-swell	0.00	 Fair Too clayey 	 0.06
76D: Ladoga	 85 	 Fair Too clayey Water erosion Too acid	 0.08 0.37 0.74	 Poor Low strength Shrink-swell	 0.00 0.28	 Fair Too clayey Slope	 0.06 0.37
76D2: Ladoga, moderately eroded	 60 	 Fair Too clayey Too acid Organic matter content	 0.02 0.74 0.88	 - Poor Low strength Shrink-swell 	 0.00 0.35	 Fair Too clayey Slope 	 0.01 0.37
86: Mt. Sterling, occasionally flooded	 60	 Fair Organic matter	 0.50	 Poor Wetness	 0.00	 Poor Wetness	 0.00
		content Too acid Water erosion	 0.97 0.99	Low strength Shrink-swell	0.00	Nethess	
Zook, occasionally flooded, overwash	 25 	 Fair Too clayey Water erosion	0.12	 Poor Wetness Low strength Shrink-swell	 0.00 0.00 0.17		 0.00 0.12
88: Nevin, rarely flooded	 90	 Fair Water erosion	 0.90	 Poor Wetness	 0.00	 Poor Wetness	 0.00
		 		Low strength Shrink-swell	0.00	 	

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	ırce
		Rating class and	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
93D2: Shelby, moderately eroded	 35	 Fair		 Fair	 	 Fair	
		Organic matter content Too clayey Too acid	0.50 0.68 0.97	Shrink-swell 	0.87 	Slope Too clayey Rock fragments	0.37 0.44 0.95
Adair, moderately eroded	 25	 Fair	 	 Poor	 	 Poor	
		Organic matter content Too clayey Too acid	0.12 0.68 0.84	Wetness Shrink-swell 	0.00	Wetness Slope Too clayey Rock fragments	0.00 0.37 0.39 0.95
93E2: Shelby, moderately	 	 	 	 	 	 	
eroded	45 	Fair Organic matter content Too clayey Too acid	 0.50 0.68 0.97	Fair Shrink-swell Slope 	 0.87 0.98 	Poor Slope Too clayey Rock fragments	 0.00 0.44 0.95
Adair, moderately eroded	30	 Fair Organic matter content Too clayey Too acid	 0.12 0.68 0.84	 Poor Wetness Shrink-swell Slope	 0.00 0.71 0.98	 Poor Wetness Slope Too clayey Rock fragments	 0.00 0.00 0.39 0.95
172: Wabash, frequently ponded,	 	 	 	 	 		
occasionally flooded	90	 Poor Too clayey Too acid	 0.00 0.97	 Poor Wetness Shrink-swell Low strength	 0.00 0.00 0.00	 Poor Too clayey Wetness	0.00
179E: Gara	 60	 Fair	 	 Fair	 	 Poor	
	 	Organic matter content Too clayey Too acid	0.50 0.88 0.95	Shrink-swell Slope 	0.87 0.98 	Slope Too clayey Rock fragments	0.00 0.57 0.95
179F: Gara	 65 	Fair Organic matter content Too clayey Too acid	 0.50 0.88 0.95	 Fair Slope Shrink-swell 	 0.18 0.87 		0.00
179G: Gara	 70 	 Fair Organic matter content Too clayey Too acid	 0.50 0.88 0.95	 Poor Slope Shrink-swell 	 0.00 0.87 	 Poor Slope Too clayey Rock fragments	 0.00 0.57 0.95

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	Potential as sou of topsoil	irce	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
192D2:		 		 			
Adair, moderately eroded		 Fair		 Poor		 Poor	
e10ded	33	Organic matter	0.12		0.00	Wetness	0.00
		content	0.12	Shrink-swell	0.71	Slope	0.37
	i	Too clayey	0.68	DITTIK-BWEIT	0.71	Too clayey	0.39
		Too acid	0.84		ļ	Rock fragments	0.95
220:				 		 	
Nodaway,	i		i		i		i
occasionally	i		i		i		i
flooded	80	Fair	İ	Poor	i	Good	i
	İ	Organic matter	0.12	Low strength	0.00	İ	İ
	İ	content	İ	Shrink-swell	0.87		İ
		Water erosion	0.37		İ		
222C2:				 		 	
Clarinda, moderately	1						
eroded	75	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.00	Wetness	0.00
		content			!		!
		Too acid	0.97	 		 	
222D:	į				į		į
Clarinda	75	!	!	Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter content	0.12	Low strength Shrink-swell	0.00	Wetness	0.00
		Too acid	0.84	SHITHK-SWEIT	0.00	Slope 	0.37
222D2:				 		 	
Clarinda, moderately	.			 	1	 	i
eroded		Poor		Poor		Poor	i
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
	i	Organic matter	0.12	Shrink-swell	0.00	Wetness	0.00
	İ	content	İ	İ	İ	Slope	0.37
		Too acid	0.97				
222D3:				 		 	
Clarinda, severely							
eroded	70	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.00	Wetness	0.00
		content Too acid	 0.97	Low strength	0.00	Slope	0.37
		100 acid				 	
248:							
Wabash, occasionally	1						
ponded,							
occasionally					[1
flooded	85	!	!	Poor	1	Poor	1
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Too acid Water erosion	0.97	Low strength Shrink-swell	0.00	Wetness	0.00

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	irce
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
269: Humeston, occasionally	 	 - -	 	 	 	 	
flooded	100 	Fair Too clayey Water erosion Too acid	 0.02 0.68 0.97	!	 0.00 0.00 0.51	Poor Wetness Too clayey 	 0.00 0.02
273B: Olmitz	 80 	 Fair Too acid 	 0.97 	 Poor Low strength Shrink-swell	 0.00 0.87	 Good 	
273C: Olmitz	 75 	 Fair Too acid	 0.97 	 Poor Low strength Shrink-swell	0.00	 Good 	
324C2: Dickman, moderately eroded	 90 	 Poor Too sandy Organic matter content Too acid	 0.00 0.12 0.84	 Good 	 	 Poor Too sandy 	 0.00
324D2: Dickman, moderately eroded	 90 	 Poor Too sandy Organic matter content Too acid	 0.00 0.12 0.84	 Good 		 Poor Too sandy Slope 	 0.00 0.37
354: Aquolls, ponded	100	 Not rated		 Not rated		 Not rated	
368: Macksburg	 85 	 Fair Too acid Water erosion Too clayey	 0.97 0.99 0.99	 Poor Wetness Low strength Shrink-swell	 0.00 0.00 0.62	 Poor Wetness Too clayey 	 0.00 0.99
369: Winterset	 100 	 Fair Too clayey Water erosion	 0.02 0.99	1	 0.00 0.00 0.25		0.00
370: Sharpsburg	95	 Fair Too clayey Organic matter content Water erosion	 0.02 0.50 0.68	 Poor Low strength Shrink-swell	 0.00 0.56	 Fair Too clayey 	 0.02

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

Map symbol and soil name	Pct. of map unit	 Potential as sourc reclamation mater 		Potential as sou of roadfill	rce	Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
370B: Sharpsburg	 95 	 Fair Too clayey Organic matter	 0.02 0.50	 Poor Low strength Shrink-swell	 0.00 0.56	 Fair Too clayey 	 0.02
		content Water erosion	0.68	 	 	 	
371C2: Sharpsburg,			<u> </u> 	 			
moderately eroded	35 	Fair Too clayey Organic matter content Water erosion	 0.02 0.50 0.68	Poor Low strength Shrink-swell 	 0.00 0.56 	Fair Too clayey 	0.01
Nira, moderately	30	 		 Poor	 	 Fair	
610060	30	Organic matter content Water erosion Too clayey	0.12 0.90 0.92	Low strength Wetness Shrink-swell	0.00 0.53 0.87	Wetness Too clayey 	0.53
371D2: Sharpsburg,	 	 	 	 		 	
moderately eroded	50 	Fair Too clayey Organic matter content Water erosion	 0.02 0.50 0.68	Poor Low strength Shrink-swell 	 0.00 0.56 	Fair Too clayey Slope 	 0.01 0.37
Nira, moderately eroded	 20 	Fair Organic matter content Water erosion Too clayey	 0.12 0.90 0.92	 Poor Low strength Wetness Shrink-swell	 0.00 0.53 0.87	 Slope Wetness Too clayey	 0.37 0.53 0.53
421C2:				 			
Gara, moderately eroded	 35 	 Fair Organic matter content Too clayey Too acid	 0.50 0.88 0.88	 Fair Shrink-swell 	 0.87 	 Fair Too clayey Rock fragments 	 0.57 0.95
Bucknell, moderately eroded		 Poor Too clayey Organic matter content Too acid	 0.00 0.12 0.54	 Poor Wetness Shrink-swell	0.00	 Too clayey Wetness Too acid	0.00
421D2: Gara, moderately eroded	 35 	 Fair Organic matter content Too clayey Too acid	 0.50 0.88 0.88	 Fair Shrink-swell 	 0.87 	 - Fair Slope Too clayey Rock fragments	 0.37 0.57 0.95

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	irce
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421D2: Bucknell, moderately		 		 	 	 	
eroded	30	Poor	!	Poor	!	Poor	
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter content	0.12	Shrink-swell	0.43	Wetness	0.00
		Too acid	0.54	 		Slope Too acid	0.98
421E2:	 				į		
Gara, moderately			<u> </u>		i		i
eroded	40	Fair	i	Fair	i	Poor	i
	į	Organic matter	0.50	Shrink-swell	0.87	Slope	0.00
	İ	content	İ	Slope	0.98	Too clayey	0.57
		Too clayey	0.88			Rock fragments	0.95
		Too acid	0.88	!	!		!
Bucknell, moderately		 				l I	
eroded		Poor		Poor		 Poor	
01000	20	Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.43	Wetness	0.00
	İ	content	i	Slope	0.98	Slope	0.00
	ĺ	Too acid	0.54	ĺ	İ	Too acid	0.98
							1
135:		 				l I	
Zook, occasionally flooded	 40	Poor		Poor	I	 Poor	1
1100404	10	Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	!	0.00	Too clayey	0.00
	į	İ	į	Shrink-swell	0.25	i	į
Mt. Sterling,		 		 		 	
occasionally	ĺ	İ	İ	ĺ	İ		İ
flooded	35	!		Poor		Poor	1
		Organic matter	0.50	Wetness	0.00	Wetness	0.00
		content		Low strength	0.00		
		Too acid Water erosion	0.97 0.99	Shrink-swell	0.34	 	
		Water erosion	0.99	 			i
169C2:	İ		j	j	i		i
Lamoni, moderately				!	!		!
eroded	35	!		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Organic matter content	0.12	Shrink-swell	0.71	Too clayey	0.00
		Too acid	0.97	 		 	1
					İ		i
Clarinda, moderately							
eroded	30			Poor	1	Poor	!
		Too clayey	0.00	Wetness	0.00	Too clayey	0.00
		Organic matter	0.12	Shrink-swell	0.00	Wetness	0.00
		content Too acid	0.97	 		 	1
				İ	İ		
Shelby, moderately							ļ
eroded	20	'		Fair	1	Fair	
		Organic matter	0.50	Shrink-swell	0.87	Too clayey	0.44
	 	content Too clavey	 0.68	[[1	Rock fragments	0.95
	 	Too clayey Too acid	0.08	 	1	 	1
	1	100 acia	0.37	!	!	1	1

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	irce
	 	 Rating class and limiting features	Value	 Rating class and limiting features	Value	 Rating class and limiting features	Value
469C3: Lamoni, severely		 		 	 	 - 	
eroded	35	Organic matter	0.12	Poor Wetness	0.00	Poor Wetness	0.00
		content Too clayey Too acid	0.68	Shrink-swell 	0.83	Too clayey 	0.39
Clarinda, severely	30	 	 	 Poor	 	 Poor	
02000		Too clayey Organic matter	0.00	Wetness Shrink-swell	0.00	Too clayey Wetness	0.00
	 	content Too acid	0.97	Low strength	0.00	 	
Shelby, severely eroded	20	 Fair	 	 Fair	<u> </u>	 Fair	
		Organic matter content Too clayey	0.50 0.68	Shrink-swell 	0.87	Too clayey Rock fragments	0.44
	 	Too crayey	0.00	 		 	
470D2: Lamoni, moderately	į Į	 	į Į	 	į Į		į į
eroded	40	!	!	Poor		Poor	
		Too clayey Organic matter	0.00	Wetness Shrink-swell	0.00 0.71	Wetness Too clayey	0.00
		content Too acid	0.97			Slope	0.37
Shelby, moderately eroded		 Fair		 Fair		 Fair	
eroueu	33	Organic matter content	0.50	1	0.87	Slope Too clayey	0.37
		Too clayey	0.68	 		Rock fragments	0.95
545B: Zook		 		 Poor		 Poor	
200k	33	Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.97	Low strength	0.00	Too clayey	0.00
Ely	30	 Fair Water erosion	!	 Poor Wetness	0.00	 Poor Wetness	0.00
				Low strength Shrink-swell	0.00		
Gullied land	20	 Not rated 	 	 Not rated 		 Not rated 	
569C: Nira	 45	 Fair		 Poor	İ	 Fair	
	İ	Organic matter		Low strength	0.00	!	0.53
		content Water erosion	0.68	Wetness Shrink-swell	0.53	Too clayey	0.53
	 	Too clayey	0.92		1	 -	1

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

Map symbol and soil name	Pct. of map unit	reclamation mater		Potential as sou of roadfill	rce	Potential as sou of topsoil	irce
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
569C:]	
Clearfield	35	Fair		Poor	İ	Poor	i
	ĺ	Organic matter	0.12	Wetness	0.00	Wetness	0.00
		content		Low strength	0.00	Too clayey	0.10
		Too clayey	0.18	Shrink-swell	0.75		1
	 	Water erosion	0.90	 		 	1
579E3:			İ		i		i
Bucknell, severely	İ		į	į	į		İ
eroded	55	Fair		Poor		Poor	
		Organic matter	0.12	Wetness	0.00	Wetness	0.00
		content		Shrink-swell	0.78	Slope	0.00
		Too acid	0.74	Slope	0.98	Too clayey	0.44
	 	Too clayey	0.76	 		 	-
Hedrick, severely	 	 		 		 	1
eroded	35	Fair	İ	Poor	i	Poor	i
	İ	Organic matter	0.12	Low strength	0.00	Slope	0.00
		content		Wetness	0.53	Too clayey	0.39
		Too clayey	0.59	Shrink-swell	0.87	Wetness	0.53
		Too acid	0.84				!
794C2:	 	 		 		 	
Armstrong,	 	 		 		 	1
moderately eroded	65	 Fair		Poor	i	Poor	i
-	İ	Organic matter	0.50	Wetness	0.00	Wetness	0.00
	İ	content	į	Low strength	0.00	Too clayey	0.54
		Too acid	0.68	Shrink-swell	0.79	Rock fragments	0.92
		Too clayey	0.82		!		1
Indoma madamatal.	 	 -		 		 	-
Ladoga, moderately eroded	 30	 Fair		Poor		 Fair	1
eroded	30	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
		Too acid	0.74	Shrink-swell	0.35		
	İ	Organic matter	0.88		i		i
		content					
					!		1
822D2:		 				 	-
Lamoni, moderately eroded	 55	Poor		Poor		 Poor	1
eroded	33	Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Organic matter	0.12	•	0.71	'	0.00
	İ	content	į	j	į	Slope	0.37
		Too acid	0.97	[[1
0.7.0-							!
870B: Sharpsburg, terrace	 05	Pair		 Poor		 Fair	
Sharpsburg, terrace	85	Too clayey	0.02	1	0.00	'	0.02
		Organic matter	0.50		0.56		
	İ	content	į	İ	İ		İ
	ĺ	Water erosion	0.68	İ	İ		İ
					ļ		
870C2:					1		1
Sharpsburg, terrace,		Pair		Poor	1	 Fair	1
moderately eroded	65	Too clayey	0.02	Poor Low strength	0.00	'	0.01
	I	co crayel	0.02		10.00	- co crayes	10.01
		Organic matter	0.50	Shrink-swell	0.56		
	 	Organic matter content	0.50	Shrink-swell	0.56	 	

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

Map symbol and soil name	Pct. of map unit	 Potential as sourc reclamation mater 		Potential as sou of roadfill 	rce	Potential as sou of topsoil	ırce
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
870D2: Sharpsburg, terrace, moderately eroded		 - Fair Too clayey Organic matter content Water erosion	 0.02 0.50 	 - Poor Low strength Shrink-swell 	 0.00 0.56	 - Fair Too clayey Slope 	 0.01 0.37
876B:	 	 		 		 	l
Ladoga, terrace	 100 	 Fair Too clayey Water erosion Too acid	 0.08 0.37 0.74	 Poor Low strength Shrink-swell 	 0.00 0.28 	 Fair Too clayey 	0.06
876C2: Ladoga, terrace, moderately eroded	 70 	 Fair Too clayey Too acid Organic matter content	 0.02 0.74 0.88	 Poor Low strength Shrink-swell	0.00	 Fair Too clayey 	 0.01
876D2:		 		 		 	
Ladoga, terrace, moderately eroded	 75 	Fair Too clayey Too acid Organic matter content	 0.02 0.74 0.88	Poor Low strength Shrink-swell 	 0.00 0.35 	 Fair Too clayey Slope 	0.01
2368B: Macksburg	 70 	 Fair Too acid Water erosion Too clayey	 0.97 0.99 0.99	 Poor Wetness Low strength Shrink-swell	 0.00 0.00 0.62	!	0.00
Nira	 25 	 Fair Organic matter content Water erosion Too clayey	 0.12 0.68 0.92	 Poor Low strength Wetness Shrink-swell	 0.00 0.53 0.87	 Fair Wetness Too clayey 	0.53
5030: Pits, limestone quarries	 100	 Not rated	 	 Not rated	 	 Not rated	
5040: Udorthents, loamy	 100	 Not rated		 Not rated	 	 Not rated	
5041: Udorthents, reclaimed	 100	 Not rated		 Not rated	 	 Not rated	
AW: Animal waste lagoon	100	 Not rated		 Not rated		 Not rated	
SL: Sewage lagoon	 100	 Not rated 		 Not rated 		 Not rated 	

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

Map symbol	Pct.	Potential as source	e of	Potential as sou	rce	Potential as sou	ırce
and soil name	of	reclamation material		of roadfill		of topsoil	
	map						
	unit						
		Rating class and	Value	Rating class and	Value	Rating class and	Valu
		limiting features		limiting features		limiting features	
:							
Water	- 100	Not rated		Not rated		Not rated	
	i		i		i	İ	i

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		eas	 Embankments, dikes levees 	, and	Aquifer-fed excavated pond 	ls
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7: Wiota, rarely flooded	 85 	 Somewhat limited Seepage 	 0.24 	 Not limited 		 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
7B: Wiota, rarely flooded	 85 	 Somewhat limited Seepage Slope	0.24	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
8B: Judson	 85 	 Somewhat limited Seepage Slope	 0.24 0.08	 Not limited 	 	 Very limited Depth to water 	1.00
15B: Olmitz	 35 	 Somewhat limited Seepage Slope	 0.24 0.08	 Somewhat limited Piping 	 0.01 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
Ely	 30 	 Somewhat limited Seepage Slope	 0.24 0.08	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10
Zook	 20 	 Somewhat limited Slope 	 0.08 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.18	 Very limited Slow refill Cutbanks cave	 1.00 0.10
16: Nodaway, occasionally flooded	 55 	 Somewhat limited Seepage 	 0.24 	 Somewhat limited Piping 	 0.08	 	 0.81 0.76 0.10
Kennebec, occasionally flooded	 35 	 Somewhat limited Seepage 	 0.24 	 Somewhat limited Piping 	 0.04 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10

Map symbol and soil name	Pct. of map unit	Pond reservoir ar - 	eas	Embankments, dikes levees 	, and	Aquifer-fed excavated ponds 			
	 	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value		
24C2: Shelby, moderately eroded	 85 	 Somewhat limited Slope Seepage	 0.92 0.24	 Not limited 	 	 Very limited Depth to water	 1.00		
24D2: Shelby, moderately eroded	 70 	 Very limited Slope Seepage	 1.00 0.24	 - Not limited - 		 - Very limited Depth to water 	 1.00		
24E: Shelby	 60 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water	1.00		
24E2: Shelby, moderately eroded	 65 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water	 1.00		
24F: Shelby	 65 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water 	1.00		
43: Bremer, rarely flooded	 85 	 Somewhat limited Seepage 	 0.24	Very limited Depth to saturated zone Hard to pack	 1.00 0.11	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
45B: Zook	 75 	 Somewhat limited Slope 	 0.08 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.18	 Very limited Slow refill Cutbanks cave	 1.00 0.10		
Ely	 20 	Somewhat limited Seepage Slope	0.24	 Very limited Depth to saturated zone	1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
54: Zook, occasionally flooded	90	 - Not limited - -	 	 - Very limited Depth to saturated zone Hard to pack	 1.00 0.18	 - Very limited Slow refill Cutbanks cave	 1.00 0.10		
54+: Zook, occasionally flooded, overwash	 80 	 Not limited 		 Very limited Depth to saturated zone Hard to pack	 1.00 0.08	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		

Map symbol and soil name	Pct. of map	Pond reservoir ar	eas	Embankments, dikes levees	, and	Aquifer-fed excavated ponds			
	unit 	Rating class and limiting features	Value	Rating class and limiting features	Value	 Rating class and limiting features	Value		
76B: Ladoga	 95 	 Somewhat limited Seepage Slope 	 0.24 0.08	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10		
76C: Ladoga	 75 	 Somewhat limited Slope Seepage	 0.92 0.24	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill	0.81		
76D: Ladoga	 85 	 - Very limited Slope Seepage 	 1.00 0.24	 Not limited 	 	Cutbanks cave	0.10 0.81 0.76 0.10		
76D2: Ladoga, moderately eroded	 60 	 - Very limited Slope Seepage 	 1.00 0.24	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10		
86: Mt. Sterling, occasionally flooded	 60 	 Somewhat limited Seepage	 0.24	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76		
Zook, occasionally flooded, overwash	 25 	 Not limited 		 Very limited Depth to saturated zone Hard to pack	1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
88: Nevin, rarely flooded	 90 	 Somewhat limited Seepage 	 0.24	 - Very limited Depth to saturated zone	 1.00	 - Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
93D2: Shelby, moderately eroded	 35 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water	 1.00		
Adair, moderately eroded	 25 	 Very limited Slope 	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to water 	 1.00		

Map symbol and soil name	Pct. of map	 Pond reservoir ar 	eas	Embankments, dikes levees	, and	Aquifer-fed excavated ponds			
	unit 	Rating class and limiting features	Value	 Rating class and limiting features	Value	Rating class and limiting features	Value		
93E2: Shelby, moderately eroded	 45 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water	 1.00		
Adair, moderately eroded	 30 	 Very limited Slope 	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to water 	 1.00		
172: Wabash, frequently ponded, occasionally flooded	 90 	 Not limited 		 	 1.00 1.00	 Very limited Slow refill Cutbanks cave	 1.00 0.10		
179E: Gara	 60 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 	 	 Very limited Depth to water 	1.00		
179F: Gara	 65 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 		 Very limited Depth to water	1.00		
179G: Gara	 70 	 Very limited Slope Seepage	1.00	 Not limited 		 Very limited Depth to water	1.00		
192D2: Adair, moderately eroded	 55 	 Very limited Slope	1.00	 Very limited Depth to saturated zone	 1.00	Very limited Depth to water	1.00		
220: Nodaway, occasionally flooded	 80 	 Somewhat limited Seepage 	 0.24 	 Somewhat limited Piping 	 0.08	 	 0.81 0.76 0.10		
222C2: Clarinda, moderately eroded		 Somewhat limited Slope 	 0.92	 Very limited Depth to saturated zone Hard to pack	 1.00 0.92	 Very limited Depth to water 	1.00		
222D: Clarinda	 75 	 Very limited Slope 	 1.00 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.84	 Very limited Depth to water 	1.00		

Map symbol and soil name	 Pct. of map unit		eas	 Embankments, dikes levees	, and	Aquifer-fed excavated ponds		
	unit 	Rating class and	Value	Rating class and limiting features	Value	 Rating class and limiting features	Value	
222D2: Clarinda, moderately eroded		 Very limited Slope 	 1.00	 Very limited Depth to saturated zone Hard to pack	 1.00 0.92	 - Very limited Depth to water	1.00	
222D3: Clarinda, severely eroded	 70 	 Very limited Slope	 1.00 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.92	 Very limited Depth to water 	 1.00 	
248: Wabash, occasionally ponded, occasionally flooded		 Not limited 		 	 1.00 1.00	 Very limited Slow refill Cutbanks cave	 1.00 0.10	
269: Humeston, occasionally flooded	 100	 Somewhat limited Seepage	 0.24	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	0.76	
273B: Olmitz	 80 	 Somewhat limited Seepage Slope 	 0.24 0.08 	 Somewhat limited Piping 	 0.01 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10	
273C: Olmitz	 75 	 Somewhat limited Slope Seepage 	0.92	 Somewhat limited Piping 	 0.01 		 0.81 0.76 0.10	
324C2: Dickman, moderately eroded	 90 	 - Very limited Seepage Slope	 1.00 0.92	 Somewhat limited Seepage 	 0.07	 Very limited Depth to water 	 1.00	
324D2: Dickman, moderately eroded	90	 Very limited Seepage Slope	 1.00 1.00	 Somewhat limited Seepage	 0.07	 Very limited Depth to water	1.00	
354: Aquolls, ponded	 100 	 Not limited 		 Not rated 	 	 Not rated 		

Map symbol and soil name	Pct. of map unit	Pond reservoir ar 	eas	Embankments, dikes levees 	, and	Aquifer-fed excavated ponds			
		Rating class and limiting features	Value	Rating class and limiting features	Value	 Rating class and limiting features	Value		
368: Macksburg	 85 	 Somewhat limited Seepage 	 0.24	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
369: Winterset	 100 	 Somewhat limited Seepage	 0.24 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.16	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
370: Sharpsburg	 95 	 Somewhat limited Seepage 	 0.24 	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81		
370B: Sharpsburg	 95 	 Somewhat limited Seepage Slope 	0.24	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10		
371C2: Sharpsburg, moderately eroded	 35 	 Somewhat limited Slope Seepage	 0.92 0.24	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81		
Nira, moderately eroded	 30 	 Somewhat limited Slope Seepage 	 0.92 0.24 	 Very limited Depth to saturated zone	 0.99 	 Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	 0.76 0.10 0.01		
371D2: Sharpsburg, moderately eroded	 50 	 - Very limited Slope Seepage 	 1.00 0.24 	 - Not limited - - -		 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10		
Nira, moderately eroded	 20 	 Very limited Slope Seepage	 1.00 0.24 	 Very limited Depth to saturated zone	 0.99 	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	 0.76 0.10 0.01		

Map symbol and soil name	Pct. of map unit	Pond reservoir ar -	eas	Embankments, dikes levees 	, and	Aquifer-fed excavated ponds			
		Rating class and	Value	Rating class and limiting features	Value	Rating class and limiting features	Value		
421C2: Gara, moderately eroded	 35 	 Somewhat limited Slope Seepage	 0.92 0.24	 Not limited 		 - Very limited Depth to water 			
Bucknell, moderately eroded		 Somewhat limited Slope 	0.92	 Very limited Depth to saturated zone	 1.00 	 Very limited Depth to water 	1.00		
421D2: Gara, moderately eroded	 35 	 Very limited Slope Seepage	1.00	 Not limited 		 - Very limited Depth to water	 1.00		
Bucknell, moderately eroded		 Very limited Slope	1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to water	 1.00		
421E2: Gara, moderately eroded	 40 	 Very limited Slope Seepage	 1.00 0.24	 Not limited 		 Very limited Depth to water			
Bucknell, moderately eroded		 Very limited Slope 	1.00	 Very limited Depth to saturated zone	1.00	 Very limited Depth to water 	1.00		
435: Zook, occasionally flooded	 40 	 Not limited 		 Very limited Depth to saturated zone Hard to pack	 1.00 0.18	 Very limited Slow refill Cutbanks cave	 1.00 0.10		
Mt. Sterling, occasionally flooded	 35 	 Somewhat limited Seepage 	0.24	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
469C2: Lamoni, moderately eroded	 35 	 Somewhat limited Slope	0.92	 	 1.00	 - Very limited Depth to water 	 1.00		
Clarinda, moderately eroded		 Somewhat limited Slope 	0.92	 Very limited Depth to saturated zone Hard to pack	 1.00 0.92	 Very limited Depth to water 	 1.00 		
Shelby, moderately eroded	 20 	 Somewhat limited Slope Seepage	0.92	 Not limited 		 Very limited Depth to water	1.00		

Map symbol and soil name	Pct. of map unit	Pond reservoir ar 	eas	Embankments, dikes levees 	, and	Aquifer-fed excavated ponds			
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value		
469C3: Lamoni, severely eroded	 35 	 Somewhat limited Slope 	 0.92	 - Very limited Depth to saturated zone	 1.00	 Very limited Depth to water 	 1.00		
Clarinda, severely eroded	 30 	 Somewhat limited Slope 	 0.92 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.92	 Very limited Depth to water 	 1.00 		
Shelby, severely eroded	 20 	 Somewhat limited Slope Seepage	 0.92 0.24	 Not limited 	 	 Very limited Depth to water	1.00		
470D2: Lamoni, moderately eroded	 40 	 - Very limited Slope -	 1.00	 	 1.00	 - Very limited Depth to water 	 1.00		
Shelby, moderately eroded	 35 	 Very limited Slope Seepage	 - 1.00 0.24	 Not limited 		 Very limited Depth to water	1.00		
545B: Zook	 35 	 Somewhat limited Slope 	 0.08 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.18	 Very limited Slow refill Cutbanks cave	 1.00 0.10		
Ely	 30 	 Somewhat limited Seepage Slope	0.24	 Very limited Depth to saturated zone	 1.00	 Somewhat limited Slow refill Cutbanks cave	 0.76 0.10		
Gullied land	20	 Not rated		 Not rated		 Not rated			
569C: Nira	 45 	 Somewhat limited Slope Seepage 	 0.92 0.24 	 Very limited Depth to saturated zone 	 0.99 	 Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	 0.76 0.10 0.01		
Clearfield	 35 	 Somewhat limited Slope Seepage 	 0.92 0.24 	 Very limited Depth to saturated zone Hard to pack	 1.00 0.34	 Somewhat limited Slow refill Cutbanks cave 	 0.76 0.10 		
579E3: Bucknell, severely eroded	 55 	 Very limited Slope	 1.00	 Very limited Depth to saturated zone	 1.00	 - Very limited Depth to water 	 1.00		

Map symbol and soil name	Pct. of map unit		eas	Embankments, dikes levees 	, and	Aquifer-fed excavated pond 	ls
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
579E3: Hedrick, severely eroded	 35 	 Very limited Slope Seepage	 1.00 0.24 	Very limited Depth to saturated zone	 0.99 	 Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	 0.76 0.10 0.01
794C2: Armstrong, moderately eroded	 65 	 Somewhat limited Slope	 0.92	 	 1.00	 - Very limited Depth to water 	 1.00
Ladoga, moderately eroded	 30 	 Somewhat limited Slope Seepage 	 0.92 0.24 	 Not limited 	 	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
822D2: Lamoni, moderately eroded	 55 	 Very limited Slope 	 1.00	 Very limited Depth to saturated zone	 1.00	 Very limited Depth to water	 1.00
870B: Sharpsburg, terrace	 85 	 Somewhat limited Seepage 	 0.24 	 Not limited - 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
870C2: Sharpsburg, terrace, moderately eroded	:	 Somewhat limited Slope Seepage 	 0.92 0.24	 Not limited 		 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
870D2: Sharpsburg, terrace, moderately eroded		 Very limited Slope Seepage	 1.00 0.24 	 Not limited 	 	 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10
876B: Ladoga, terrace	 100 	 Somewhat limited Seepage 	 0.24 	 Not limited 		 Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	 0.81 0.76 0.10

Map symbol and soil name	Pct. of map unit		eas	Embankments, dikes levees 	, and	Aquifer-fed excavated ponds			
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value		
876C2:		 		 		 			
Ladoga, terrace,	İ	İ	İ	İ	İ	İ	İ		
moderately eroded	70	Somewhat limited	İ	Not limited	İ	Somewhat limited	İ		
	ĺ	Slope	0.92	ĺ	İ	Depth to	0.81		
	İ	Seepage	0.24	İ	İ	saturated zone	İ		
	İ	İ	İ	İ	İ	Slow refill	0.76		
	į	 	į	 -	į	Cutbanks cave	0.10		
876D2:		 		 		 			
Ladoga, terrace,									
moderately eroded	75	Very limited	1	Not limited		Somewhat limited			
		Slope	1.00			Depth to	0.81		
		Seepage	0.24			saturated zone			
						Slow refill	0.76		
	 	 		 		Cutbanks cave	0.10		
2368B:			ļ						
Macksburg	70	!		Very limited		Somewhat limited			
		Seepage	0.24	Depth to	1.00	'	0.76		
	 	Slope 	0.08	saturated zone		Cutbanks cave	0.10		
Nira	25	Somewhat limited	i	 Very limited	i	Somewhat limited	i		
	İ	Seepage	0.24	Depth to	0.99	Slow refill	0.76		
	İ	Slope	0.08	saturated zone	İ	Cutbanks cave	0.10		
						Depth to	0.01		
		1		 -		saturated zone	İ		
5030:		 		 		 			
Pits, limestone									
quarries	100	Not rated 		Not rated 		Not rated 			
5040:			į						
Udorthents, loamy	100 	Not rated 		Not rated 		Not rated 			
5041:	İ	İ	į	İ	į		İ		
Udorthents,									
reclaimed	100	Not rated		Not rated 		Not rated 			
AW:							1		
Animal waste lagoon	100 	Not rated 		Not rated 		Not rated 			
SL:		_	į	_		_	1		
Sewage lagoon	100 	Not rated 		Not rated 		Not rated 	1		
W:	İ		į				[
Water	100	Not rated		Not rated		Not rated	1		

Soil Properties

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

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

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

Engineering Properties

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

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

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

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

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

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

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

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

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

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

References:

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

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

Engineering Properties

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

Map symbol	Depth	USDA texture	Classi	fication	Frag	ments	P∈	ercentage sieve n	_	_	 Liquid	 Plas-
and soil name				1	>10	3-10					limit	
una 5011 mamo	! 		Unified	AASHTO		inches	4	10	40	200		index
	In			İ	Pct	Pct		İ			Pct	
7:	 										 	
Wiota, rarely												
flooded	0-8 	Silty clay loam, silt loam	CL 	A-7, A-6	0	0	100 	100	92-100 	87-99 	38-52 	13-22
	8-28	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	92-100	87-99	37-51	13-22
	28-59	Silty clay loam	CL	A-7	i o	0	100	100	97-100	93-98	41-49	21-25
		Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100		94-100	1	
7B:												
Wiota, rarely	İ	İ	į	j	i	İ		Ì		İ	į	İ
flooded	0-8	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	92-100	87-99	38-52	13-22
	8-28	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	92-100	87-99	37-51	13-22
	28-59	Silty clay loam	CL	A-7	i o	0	100	100	97-100	93-98	41-49	21-25
	59-80	Silt loam, silty clay loam	CL	A-7, A-6	0	0	100	100	98-100	94-100	35-46	17-24
8B:	 					 				 	 	
Judson	0-9	Silty clay loam	CL, ML	A-6, A-7	i o	i o	100	100	95-100	92-100	40-51	16-22
		Silty clay loam	CL, ML	A-7	0	0	100	100		93-98		1
		Silty clay loam	CL	A-7	0	0	100	100		94-99		1
		Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100		92-99		
15B:	 									 	 	
Olmitz	0-7	Loam	CL	A-6	0	0	100	90-100	79-91	59=68	40-47	16-19
	7-30	Loam, clay loam	CL	A-6	0	0	100			58-77		1
	30-60	Clay loam	CL	A-6, A-7	0	0	100	90-100	76-94	61-74	39-48	19-24
Ely	 0-8 	 Silty clay loam, silt loam	 CL 	 A-7 	0	0	 100 	100	 92-100 	 86-98 	 43-57 	 15-24
		Silty clay loam	CL	A-7	0	0	100	100	92-100	86-98	41-55	15-24
	24-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	90-97	39-51	19-25
	58-80 	Silt loam, silty clay loam	CL	A-6	0	0	100	100	89-100 	83-100 	30-47 	12-25

Map symbol	 Depth	USDA texture	Classi	fication	Fragi	ments	Percentage passing sieve number				 	 Plas-
and soil name			Unified	AASHTO	>10	3-10	 	10	40	200	limit	
	In	[AASHIO	Pct	Pct	-	10		200	Pct	
15B:	 								 			
Zook	0-7		CH	 A-7	0	 0	100	100	 98-100	 93-100	51-68	22-32
200	• .	clay					====	200				
	7-20	Silty clay loam, silty	СН	A-7	0	0	100	100	94-100	90-100	51-68	22-32
	ĺ	clay	İ	j	j		İ	ĺ	ĺ	İ	İ	İ
	20-38	Silty clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
		loam										
	38-61	Silty clay, silty clay	СН	A-7	0	0	100	100	96-100	92-100	50-63	26-32
		loam	l arr		 0		100	100				
	 61-80	Silty clay loam, silty clay, silt loam	CH, CL	A-6, A-7	0	0	100	100	 87-100	83-100	31-56	13-32
	 	Clay, Silt loam				 	 	l I	 	 	 	
16:	İ			i	i	! 	i	İ	İ	i	i	i
Nodaway,	į		İ	j	j	İ	İ	į	į	İ	į	i
occasionally	ĺ		İ	j	j		ĺ	ĺ	ĺ	ĺ	İ	İ
flooded	0 - 7	Silt loam, silty clay	CL	A-6	0	0	100	95-100	87-100	83-100	30-48	11-24
		loam										
	7-80		CT	A-6	0	0	100	95-100	86-100	82-100	29-46	12-25
		silty clay loam, silt										
	l I	loam, silty clay loam		l I		 	 	l I	 	 	 	
Kennebec,	 					 		 	 		 	
occasionally	 			i			i		! 	i	İ	i
flooded	0-7	Silt loam, silty clay	CL	A-7, A-6	0	0	100	100	93-100	90-100	37-53	12-21
	j	loam	İ	j	į	İ	į	į	j	į	į	į
	7-16	Silt loam, silty clay	CL	A-6	0	0	100	100	89-100	86-100	36-54	12-22
		loam										
	16-35	Silt loam, silty clay	CT	A-6	0	0	100	100	89-100	86-100	33-51	12-22
		loam			 0	 0	100	100			126 40	116.00
	35-48	Silt loam, silty clay	CL	A-6	0	0	100	100	94-100 	90-99	36-48	16-23
	 48-80	Silt loam, silty clay	CL	 A-6	0	 0	100	100	 98_100	 93_99	36-45	 16-21
	10 00	loam				•	100	100	30 100			
	İ		İ	i	i	! 	i	i	İ	i	i	i
24C2:	İ	İ	İ	j	į		į	į	İ	į	į	į
Shelby,												
moderately			[[[[[
eroded		Clay loam, loam	CL	A-6	0						39-52	
		Clay loam	CL	A-6, A-7	0						39-50	
		Clay loam, loam	CL	A-6, A-7	0				,		35-47 35-47	
	45-80 	CIAY IOAM, IOAM	CT	A-6, A-7	0	U-4	 31-32	02-95 	/U-92 	33-/4 	35-4/	I / - 26
	I	I	1	1	1	I	1	1	I	1	1	1

Map symbol	 Depth	USDA texture	Classi	fication	Frag	Fragments F		Percentage passing sieve number			Liquid	 Plas-
and soil name			Unified	AASHTO	>10 inches	3-10	4	10	40	200	limit	ticity
j	In	İ		i	Pct	Pct	İ	İ	İ		Pct	
24D2:	 						 					
Shelby, moderately					į	 		 	 			
eroded	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-96	54-77	39-52	16-25
į	7-31	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
į	31-48	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
İ	48-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
24E:								 	 			
Shelby	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	71-97	55-78	40-53	16-25
	7-11	Clay loam	CL	A-6, A-7	0		1	80-95		1 -		16-25
	11-46	Clay loam	CL	A-6, A-7	0	0 - 4					39-50	
	46-60	Loam, clay loam	CL	A-6, A-7	0	0-4	1 -			1 -	35-47	
	60-80 	Loam, clay loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
24E2: Shelby,			į				<u> </u> 	 		<u> </u>	<u> </u> 	<u>.</u>
moderately			 GT									116 05
eroded	0-7 7-31	Clay loam, loam Clay loam	CL	A-6 A-6, A-7	0	0	95-100	82-100	1		1	16-25
ļ	31-48	Clay loam	CL	A-6, A-7	0	0-5	1			1	35-47	1
I	31-48	Clay loam, loam	CL	A-6, A-7	0	0-4					35-47	
	40-00	Clay Ioam, Ioam		R-0, R-7								
24F:												
Shelby	0-7 7-11	Clay loam, loam	CL	A-6 A-6, A-7	0	0					40-53	16-25
	/-11	Clay loam Clay loam	CL	A-6, A-7	0	0-5		80-95			38-51	
ļ	46-60	Loam, clay loam	CL	A-6, A-7	0						35-47	
	60-80	Loam, clay loam	CP	A-6, A-7	0	1					35-47	
43:	 							 	 			
Bremer, rarely	i	İ	i		i	İ	İ	i	i	İ	i	i
flooded	0-8	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
į	8-19	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	91-100	45-59	18-25
į	19-42	Silty clay loam, silty clay	СН	A-7	0	0	100	100	94-100	89-99	47-59	25-33
į	42-50	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	40-51	21-29
	50-60	Silty clay loam	CH, CL	A-7	i o	0	100	100	01 100	00 07	26 51	17-29

Map symbol	Depth		Classi	fication	Fragments		Percentage passing sieve number				Liquid	
and soil name			Unified	AASHTO	>10	3-10 inches	4	10	40	200	limit	ticity
	In	<u> </u>		AASHIO	Pct	Pct		10	40	200	Pct	Index
		İ		İ	i	i i		i	j	İ		İ
45B:		ļ						[
Zook	0-7	Silty clay loam, silty clay	CH	A-7	0	0	100	100			51-68	
		Silty clay loam, silty clay	CH 	A-7 	0	0 	100	100 	į	İ	51-68 	İ
		Silty clay, silty clay loam	CH, CL	A-7 	0	0 	100	100 	į	İ	49-65 	İ
	38-61	Silty clay, silty clay loam	CH 	A-7 	0	0 	100	100 	96-100	92-100 	50-63 	26-32
	61-80	Silty clay loam, silty clay, silt loam	CH, CL 	A-6, A-7 	0	0 	100	100	87-100	83-100 	31-56	13-32
Ely	0 - 8	Silty clay loam, silt loam	CT	 A-7	0	 0 	100	100	92-100	 86-98 	 43-57 	 15-24
j	8-24	Silty clay loam	CL	A-7	0	0	100	100	92-100	86-98	41-55	15-24
	24-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	90-97	39-51	19-25
	58-80	Silt loam, silty clay loam	CT	A - 6 	0	0 	100	100	89-100	83-100	30-47	12-25
54: Zook,		 				 				 	 	
occasionally												
flooded	0 - 7	Silty clay loam, silty clay	CH	A-7	0	0 	100	100	į	İ	51-68	İ
		Silty clay loam, silty clay	CH 	A-7	0	0 	100	100	į	İ	51-68 	İ
	20-38	Silty clay, silty clay loam	CH, CL	A-7 	0	0 	100	100	90-100	86-99 	49-65 	23-32
	38-61	Silty clay, silty clay loam	CH 	A-7 	0	0 	100	100 	96-100	92-100 	50-63 	26-32
	61-80	Silty clay loam, silty clay, silt loam	CH, CL	A-6, A-7	0	0 	100	100	87-100	83-100	31-56	13-32
54+:						 				 		
Zook, occasionally		 			ļ	 				 	 	
flooded,	0.7						100	100	 0F 100	106.00		112 10
overwash	0-7 7-13	Silt loam Silt loam	CL	A-6 A-6	0 0	0 0	100 100	100			35-46 35-46	,
		Silt loam Silty clay loam, silty clay	CH, CL	A-6 A-7	0	0 0 	100	100			35-46 49-65 	
	50-58	clay Silty clay, silty clay loam	 CH 	 A-7	0		100	100	96-100	92-100	 50-63 	26-32
	58-80	Silty clay loam, silty clay, silt loam	CH, CL	A-6, A-7	0	0	100	100	87-100	83-100	31-56	13-32

Map symbol	 Depth	USDA texture	Classi	fication	Frag	ments	Percentage passing sieve number				 Liquid	 Plas-
and soil name					>10	3-10					limit	1
			Unified	AASHTO	inches	inches	4	10	40	200		index
	In				Pct	Pct					Pct	
76B:	 							1	l	 		
Ladoga	0-7	Silt loam	CL	A-6	0	0	100	100	91-100	90-100	34-52	12-25
	7-14	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	89-100	88-100	27-47	10-25
	14-51	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	96-100	95-100	46-55	25-31
	51-60 	Silty clay loam, silt loam	CL	A - 6 	0	0	100	100	97-100	96-100	34-44	16-23
76C:	 									 		
Ladoga	0-7	Silt loam	CH, CL	A-6	0	0	100	100	91-100	90-100	34-52	12-25
	7-14	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	89-100	88-100	27-47	10-25
	14-51 	Silty clay loam, silty clay	CH, CL 	A - 7 	0	0	100	100 	96-100	95-100 	46-55 	25-31
	51-60 	Silty clay loam, silt loam	CL	A-6	0	0	100	100	97-100	96-100 	34-44	16-23
76D:	 									 		
Ladoga	0-7	Silt loam	CL	A-6	0	0	100	100	91-100	90-100	34-52	12-25
3 .		Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100			27-47	1
	14-51	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100			46-55	
	51-60	Silty clay loam, silt loam	CL	A-6	0	0	100	100	97-100	96-100	34-44	16-23
76D2: Ladoga, moderately	 	 								 	 	
eroded	0-7	Silt loam	CL	 A -6	0	0	100	100	93-100	92-100	33-51	12-25
		Silty clay loam, silty	CH, CL	A - 7	0	0	100	100	95-100			1
	49-63	Silty clay loam	CL	A-7	0	0	100	100	97-100	95-100	37-44	19-23
	63-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	98-100	97-100	34-44	16-23
86: Mt. Sterling,	 					 				 	 	
occasionally		laile less					100	1 100				
flooded		Silt loam Silt loam, silty clay loam	ML CL	A-6, A-7 A-7, A-6	0	0	100	100			29-43	1
	26-54	silty clay loam, silty clay	CH	 A-7	0	0	100	100	95-100	 91-100 	 45-57 	 25-33
	54-80	Silty clay loam, silty clay	CL	A-7	0	0	100	100	93-100	 89-100 	45-60	25-35

Map symbol	 Depth	USDA texture	Classi	fication	Frag	gments Percentage passing sieve number					 Liquid	 i Plas
and soil name	Dopon	ODDII CORCUIC		I	>10	3-10	Ι.	51010 11	umb C I		limit	
4114 DOZZ 1141110	! 	İ	Unified	AASHTO		inches	4	10	40	200		index
	In	İ	İ	İ	Pct	Pct	İ	İ	İ	Ī	Pct	İ
86:	 	 		l I			 	 	 			
Zook,	! 		İ		i		i	 	 	İ		İ
occasionally	! 		İ		i		i	 	 	İ		İ
flooded,	l I		! 		i	 		l I	 	i i	 	i
overwash	0-7		CL	A-6	0	0	100	100	 95-100	86-98	35-46	 13_18
010144011	7-13	Silt loam	CL	A-6	0	0	100	100			35-46	
		Silty clay loam, silty	CH, CL	A-7	0	0	100	100		1	49-65	
	13-30 	clay		A - 7		0	1 100	100	33-100 		45-05	23-32
	 50-58	Silty clay, silty clay	CH	A-7	0	0	100	100	 96-100	92-100	50-63	 26-32
	30 30	loam		/			100	100	30 100	100	30 03	1 20 32
	 58-80	Silty clay loam, silty	CH, CL	A-6, A-7	0	0	100	100	 87-100	83-100	31-56	 13-32
	50 00	clay, silt loam	0117 02				=00	====				1
	! 		İ		i		i	 	 	İ		İ
88:	! 		İ		i		i	 	 	İ		İ
Nevin, rarely	! 		İ		i		i	 	 	İ		İ
flooded	0-8	Silt loam, silty clay	CL	A-7	0	0	100	100	 99-100	93-96	44-53	 18-20
		loam		/			=00	====				
	8-30	Silty clay loam	CL	A-7	0	0	100	100	96-99	90-93	44-53	 18-20
		Silty clay loam	CL	A-7	0	0	100	100			41-49	
		Silty clay loam, silt	CL	A-7	0	0	100	100		1	35-47	
		loam		/								
93D2:	 	 					 	 	 	 		
Shelby,												
moderately												
eroded	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-96	54-77	39-52	16-25
	7-31	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
	31-48	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	48-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
Adair,	l I		i i		i	 		l I	 	i i	 	i
moderately	! 				Ì	 	i	i I	İ	i	 	i
eroded	 0-7	Clay loam, silty clay	CL	 A-7	0	0	100	100	 86-100	73-89	 39-55	 16-28
J_Juou	, ,	loam		<i>'</i>			100	100				, _0 20
	 7-17	Clay, silty clay, clay	CH, CL	 A-7	0	0	95-100	76-100	61-100	51-89	49-72	27-44
	, , <u>-</u> ,	loam		<i>'</i>			-3 -30				-5 ,2	, _, _,
	17-60	Clay loam	CL	A-6, A-7	0	0	95-100	78-100	70-98	59-83	39-49	 21-27
	60-76	Clay loam	CL	A-6, A-7	0	1					39-49	
		Clay loam	CL	A-6, A-7	0	0					39-49	
	, I		1	, ,								

Map symbol	Depth	USDA texture	Classi	fication	Frag	ments		rcentag	_	ng	 Liquid	 Plas-
and soil name					>10	3-10	i					ticity
			Unified	AASHTO		inches	4	10	40	200		index
	In				Pct	Pct	İ				Pct	
93E2:											 	
Shelby,					i	i	i	İ	i	İ	 	i
moderately					i	 	l I	i i	l I	i i	 	i
eroded	0-7	Clay loam, loam	CL	 A-6	0	0	95-100	82-100	70-96	54-77	 39-52	16-25
01000		Clay loam	CL	A-6, A-7	0		1	1	1	56-73	!	21-27
	31-48	Clay loam, loam	CL	A-6, A-7	0					54-74		1
	48-80	Clay loam, loam	CL	A-6, A-7	0					55-74		
Adair,					l I						 	
moderately		İ		i	i	İ	İ	i	İ	i	İ	i
eroded	0-7	Clay loam, silty clay	CL	A-7	0	0	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay	CH, CL	A-7	0	0	95-100	76-100	61-100	51-89	 49-72 	27-44
	17-60	Clay loam	CL	A-6, A-7	i o	0	95-100	78-100	70-98	59-83	39-49	21-27
		Clay loam	CL	A-6, A-7	0	0		79-100				21-27
		Clay loam	CL	A-6, A-7	0	0		79-100				21-27
172:								 		 	 	
Wabash,												
frequently												
ponded,												
occasionally												
flooded	0-6	Silty clay	CH	A-7	0	0	100	100	90-100	88-100	58-81	28-43
	6-19	Silty clay, clay	CH	A-7	0	0	100	100	89-100	85-100	55-86	29-45
	19-60	Silty clay, clay	CH	A-7	0	0	100	100	89-100	85-100	53-82	29-46
179E:												
Gara	0-7	Loam	CL	A-4, A-6	0	0				49-92		7-25
	7-12	Loam	CL	A-6	0	0		82-100				12-25
	12-45	Clay loam, loam	CL	A-6	0	0-4				53-72		
	45-80	Loam, clay loam	CL	A-7, A-6	0 	0-4	91-95	82-95	70-92 	55-75 	34-46	16-25
179F:		ļ										
Gara		Loam	CL	A-4, A-6	0					49-82		7-25
		Loam	CL	A-6	0	0				51-79		12-25
		Clay loam, loam	CL	A-6	0					53-72		
	45-80	Loam, clay loam	CL	A-7, A-6	0 	0-4	91-95 	82-95 	70-92 	55-75 	34-46 	16-25
179G:			j	İ	į	İ	į	i	į	i	İ	į
Gara	0-7	Loam	CL	A-4, A-6	0	0	95-100	82-100	65-100	49-82	29-52	7-25
	7-12	Loam	CL	A-6	0	0	95-100	82-100	68-99	51-79	31-49	12-25
	12-45	Clay loam, loam	CL	A-6	0					53-72		17-25
	45-80	Loam, clay loam	CL	A-7, A-6	0	0-4	91-95	82-95	70-92	55-75	34-46	16-25
					1			1		1	1	1

Map symbol	Depth	oth USDA texture	Classi	fication	_i	ments	Percentage passing _ sieve number					 Plas-
and soil name			Unified	AASHTO	>10 inches	3-10	 4	10	40	200	limit	ticity
	In	<u> </u>			Pct	Pct					Pct	
 192D2:						 	 	 	 	 	 	
Adair,		İ	İ	i	i	i	İ	İ	i	i	İ	i
moderately		İ	İ	i	i	į	j	į	i	i	İ	i
eroded	0-7	Clay loam, silty clay loam	CL	A-7	0	0 	100	100	86-100	73-89	39-55	16-28
	7-17	Clay, silty clay, clay	CH, CL	A-7	0	0 	95-100	76-100	61-100	51-89	49-72	27-44
İ	17-60	Clay loam	CL	A-6, A-7	0	0	95-100	78-100	70-98	59-83	39-49	21-27
İ	60-76	Clay loam	CL	A-6, A-7	0	0	95-100	79-100	69-96	54-77	39-49	21-27
!	76-80	Clay loam	CL	A-6, A-7	0	0	96-100	79-100	70-96	55-77	39-49	21-27
220:							 	 			 	
Nodaway, occasionally						 	 	 	 	 	 	
flooded	0-7	Silt loam, silty clay loam	CL	A-6	0	0	100	95-100	87-100	83-100	30-48	11-24
Ī	7-80	Stratified silt loam to	CL	A-6	j o	0	100	95-100	86-100	82-100	29-46	12-25
		silty clay loam, silt loam, silty clay loam		j I	j I	 	 	 	i I	j 	i 	j
 222C2: Clarinda,		 	 			 	 	 	 	 	 	
moderately				Ţ	ļ							
eroded		Silty clay loam	CL	A-7	0	0			87-100		1	
	6-80	Clay, silty clay	CH	A-7	0	0 	94-100 	89-100 	79-100 	75-100 	51-71	29-44
222D:										İ		İ
Clarinda		Silty clay loam	CL	A-7	0	0	100		87-100		1	
		Silty clay loam	CL	A-7	0	0	100		87-100		1	
		Silty clay, clay Silty clay, clay	CH CH	A-7 A-7	0 0	0 0	100 100		86-100 84-100		1	
222D2:					į	į	İ	į	į	į	į	į
Clarinda, moderately		 				 	 	 	 	 	 	
eroded	0-6	 Silty clay loam	CL	 A-7	0	 0	100	 94-100	 87-100	84-100	39-56	17-28
		Clay, silty clay	СН	A-7	0	0			79-100		1	
222D3:						 	 	 	 	 	 	
Clarinda,												
severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
1	4-80	Clay, silty clay	CH	A-7	0	0	04 100	00 100	70 100	75 100	49-69	29-44

Map symbol	 Depth	USDA texture	Classi	fication	Fragi	ments		rcentago sieve n	_	ng	 Liquid	 Plas-
and soil name			Unified	 AASHTO	>10	3-10	4	10	40	200	limit	ticity
	 In		Onlined	AASHIO	Pct	Pct	4	10	40	200	Pct	Index
248:		[
Wabash, occasionally ponded,	 	 				 	 	 	 		 	
occasionally	İ	i	i	i	i	İ	i	İ	i	i	İ	İ
flooded	0-7	Silty clay loam	СН	A-7	i o	0	100	100	95-100	89-94	53-63	25-28
	7-15	Silty clay loam	CH	A-7	j o	0	100	100	95-100	89-94	53-63	25-28
	15-36	Silty clay, clay	CH	A-7	j o	0	100	100	89-100	85-100	57-86	29-45
	36-80	Silty clay, clay	СН	A-7	0	0	100	100	89-100	85-100	53-82	29-46
269: Humeston,	 	 				 	 	 	 		 	
occasionally	! 	İ		i	i	! 	i		i	i		
flooded	0-8	Silt loam, silty clay loam	CL	A-6	0	 0 	100	100	95-100	87-93	40-49	16-21
	8-13	Silt loam, silty clay	CL	A-6	0	 0 	100	100	95-100	87-93	40-49	16-21
	13-22	Silt loam	CL	A-6	i o	0	100	100	94-100	85-91	33-42	13-18
		Silty clay loam	CL	A-7	0	0	100	100		89-94	1	21-25
		Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100		90-100	1	25-35
	50-60	Silty clay loam	CL, CH	A-7	0	0	100	100	96-100	89-97	40-50	21-27
273B:	 	 				 	 	 	 			
Olmitz	0-7	Loam	CL	A-6	0	0	100	90-100	79-91	59-68	40-47	16-19
	7-30	Loam, clay loam	CL	A-6	0	0	100	90-100	76-97	58-77	37-50	15-24
	30-60	Clay loam	CL	A-6, A-7	0	0	100	90-100	79-94	61-74	39-48	19-24
273C:	 											
Olmitz	0-7	Loam	CL	A-6	0	0	100	90-100	79-91	59-68	40-47	16-19
		Loam, clay loam	CL	A-6	0	0	100	1		58-77	1	
	30-60	Clay loam	CL	A-6, A-7	0	0	100	90-100	79-94 	61-74	39-48	19-24
324C2: Dickman,						 	 	 	 			
moderately												
eroded		Fine sandy loam	SC-SM	A-4, A-2	0	0				46-59	1	6-12
	6-19 	Fine sandy loam, sandy loam	SC-SM, SC	A-4, A-2 	0 	0 	95-100 	90-100 	80-97 	32-44	20-31 	6-12
		Loamy fine sand	SM	A-2	0	0				21-29	,	1-6
		Fine sandy loam	SC-SM	A-2	0	0				32-44	,	6-12
		Fine sand	SM	A-2	0	0				15-22	,	1-6
	69-80 	Silty clay loam, silt loam	CL	A-6 	0 	0 	95-100 	82-100 	78-100 	77-100 	29-40 	13-21

Map symbol	Depth	USDA texture	Classi	fication	Fragi	Fragments		Percentage passing sieve number				 Plas-
and soil name		İ		1	>10	3-10	İ				limit	ticity
			Unified	AASHTO	inches	inches	4	10	40	200		index
	In				Pct	Pct	 				Pct	
324D2:					İ							
Dickman, moderately							 			[
eroded	0-6	Fine sandy loam	SC-SM	A-6	į o	0	95-100	90-100	76-92	46-59	22-33	6-12
	6-19	Fine sandy loam, sandy	SC-SM, SC	A-4, A-2	0	0	95-100	90-100	80-97	32-44	20-31	6-12
		loam										
		Loamy fine sand	SM	A-2	0	0			82-97		15-23	1-6
		Fine sandy loam	SC-SM	A-2	0	0			80-97		20-30	6-12
		Fine sand	SM	A-2	0	0			83-97			1-6
	69-80	Silty clay loam, silt loam	CL	A - 6 	0 	0 	95-100 	82-100 	78-100 	77 -1 00 	29-40 	13-21
354.		 				 	 	 		 	 	
Aquolls, ponded						 				İ		
368:		 		1		 	l I	! 		l İ		
Macksburg	0 - 6	Silty clay loam	CL	A-7	0	0	100	100	99-100	98-100	48-56	21-24
	6-24	Silty clay loam	CL	A-7	0	0	100	100	99-100	98-100	46-54	21-24
	24-42	Silty clay loam, silty clay	CH	A-7	0	0 	100 	100 	96-100	95-100 	50-59 	26-30
	42-73	Silt loam, silty clay	CL	A-7, A-6	0	0	100	100	97-100	95-100	38-47	18-23
		loam				 	 	 		 		
369:							İ					
Winterset	0-7	Silty clay loam	CL	A-7	0	0	100	100	97-100	95-100	46-56	19-24
	7-19	Silty clay loam	CL	A-7	0	0	100	100			49-56	
	19-58	Silty clay, silty clay loam	CH	A-7	0	0 	100 	100 	96-100 	95-100 	48-59 	26-30
	58-69	Silty clay loam, silt loam	CL	A-7	0	0	100	100	94-100	92-100	35-47	17-25
370: Sharpsburg	0-8	 Silty clay loam	CH, CL	 A-7	0	 0	 100	100	 95-100	 94-100	 43-53	 18-24
2		Silty clay loam	CH, CL	A-7	0	0	100	100	97-100			21-24
		Silty clay loam, silty	CL, CH	A-7	0	0	100	100			48-57	26-30
		clay	j	i	j	İ	į	į	İ	į	į	i
j	38-60	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	95-100	94-100	35-46	17-24
		loam				 	 	 		 	 	
370B:												
Sharpsburg		Silty clay loam	CH, CL	A-7	0	0	100	100	1		43-53	1
		Silty clay loam	CH, CL	A-7	0	0	100	100	97-100			21-24
	17-38	Silty clay loam, silty	CL, CH	A-7	0	0	100	100	96-100	95-100	48-57	26-30
	20.55	clay										
	38-60	Silty clay loam, silt loam	CL	A-6, A-7	0	0 	100	100	95-100	94-100 	35-46 	17 - 24
		100m				 	I I	I I	1	! 	 	1

Map symbol	 Depth	USDA texture	Classi	fication	Frag	Fragments		Percentage passing sieve number				 d Plas-
and soil name	 	İ	Unified	AASHTO	>10	3-10	i	10	40	200	limit	ticity index
	l In	<u> </u>	OHITIEG	ARSHIO	Pct	Pct	"	10	40	200	Pct	Index
	İ	İ	İ	i	i	İ	i	i	i	i	į	i
371C2:												
Sharpsburg,												
moderately							100	100				110.04
eroded		Silty clay loam Silty clay loam, silty	CH, CL	A-7 A-7	0	0	100	100		94-100	42-52	26-31
	/-31 	clay	CL, CH	A - 7	0	0	1 100	1 100	30-100	33-100	1 0-33	20-31
	31-70	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	93-100	92-100	35-50	17-27
		loam										
	70-80	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	98-100	97-100	35-46	17-24
į		loam	į	į	į	į	į	į	į	į	į	į
Nira, moderately	 	 			İ							
eroded	0-7	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	96-100	44-51	21-24
ļ	7-12	Silty clay loam	CL	A-7	0	0	100	100		97-100		23-27
	12-45	Silty clay loam	CL	A-6, A-7	0	0	100	100			39-45	1
	45-80 	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
371D2:	 	 										
Sharpsburg,												
moderately												
eroded		Silty clay loam	CH, CL	A-7	0	0	100	100			42-52	
	7-31	Silty clay loam, silty	CL, CH	A-7	0	0	100	100	96-100	95-100	46-55	26-31
	 31-70	clay Silty clay loam, silt	 CL	 A-6, A-7	0	 0	 100	 100	102 100	100 100	 35-50	117 07
	31-70	loam	CT	A-0, A-/	0	0	1 100	1 100	 93-100	92-100	35-50	111-21
	 70-80	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	 98-100	 97-100	 35-46	 17-24
	70 00	loam										
Nira, moderately	 	 					 	 	 	 	 	
eroded	0-7	Silty clay loam	CL, CH	A-7	0	0	100	100	98-100	96-100	44-51	21-24
ļ	7-12	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	12-45	Silty clay loam	CL	A-6, A-7	0	0	100	100			39-45	1
	45-80	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	96-100	95-100	35-42	17-21
	 	loam			l I							
421C2:	İ	İ	j	İ	i	İ		i			į	
Gara, moderately					- [[[[
eroded		Loam, clay loam	CL-ML, CL	A-4, A-6	0	1		82-100			1	7-25
	5-43	Clay loam	CL	A-6	0	1		81-95			1	
ļ	43-62	Clay loam	CL	A-7, A-6	0	1		81-95 82-95			1	
	62-80 	Loam, clay loam	 CP	A-7, A-6	0	0-4	 3T-32	82-95 	/U-92 	35-/5	34-46 	10-25

Map symbol	Depth	USDA texture	Classi	fication	Frag	Fragments		Percentage passing sieve number				│ l Plas-
and soil name	Dopon	ODDIT CONCUTE		1	>10	3-10	i İ	DICTO II	diibci			ticity
and boll name	! 		Unified	AASHTO		inches	4	10	40	200		index
	In				Pct	Pct					Pct	
421C2:	 											
Bucknell,												
moderately												
eroded	0-7	Silty clay loam	CL	A-7, A-6	0	0	94-100	89-100	84-100	74-93	39-52	17-25
		Clay	CH	A-7	0	0	95-100	89-100	81-100	68-86	49-61	29-37
	34-71	Clay loam	CL	A-6, A-7	0	0	95-100	90-100	76-97	52-25	37-50	19-29
	71-80	Clay loam	CL	A-6, A-7	0	0	95-100	91-100	79-97	59-75	39-50	21-29
421D2:	 											
Gara, moderately												
eroded	0-5	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0	95-100	82-100	62-98	45-78	28-51	7-25
	5-43	Clay loam	CL	A-6	0	0-4	91-95	81-95	72-90	57-72	39-47	21-25
	43-62	Clay loam	CL	A-7, A-6	0	0-4	91-95	81-95	72-90	57-72	39-46	21-25
	62-80	Loam, clay loam	CL	A-7, A-6	0	0-4	91-95	82-95	70-92	55-75	34-46	16-25
Bucknell,	 											
moderately												
eroded	0-7	Silty clay loam	CL	A-7, A-6	0	0	94-100	89-100	84-100	74-93	39-52	17-25
	7-34	Clay	CH	A-7	0	0	95-100	89-100	81-100	68-86	49-61	29-37
	34-71	Clay loam	CL	A-6, A-7	0	0	95-100	90-100	76-97	57-75	37-50	19-29
	71-80	Clay loam	CL	A-6, A-7	0	0	95-100	91-100	79-97	59-75	39-50	21-29
421E2:	 											
Gara, moderately												
eroded	0-5	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0	95-100	82-100	62-98	45-78	28-51	7-25
	5-43	Clay loam	CL	A-6	0	0-4	91-95	81-95	72-90	57-72	39-47	21-25
	43-62	Clay loam	CL	A-7, A-6	0	0-4	91-95	82-95	72-90	57-72	39-46	21-25
	62-80	Loam, clay loam	CL	A-7, A-6	0	0-4	91-95	82-95	70-92	55-75	34-46	16-25
Bucknell,												
moderately												
eroded	0-7	Silty clay loam	CL	A-7, A-6	0	0	94-100	89-100	84-100	74-93	39-52	17-25
	7-34	Clay	CH	A-7	0	0	95-100	89-100	81-100	68-86	49-61	29-37
	34-71	Clay loam	CL	A-6, A-7	0	0	95-100	90-100	76-97	57-75	37-50	19-29
	71-80	Clay loam	CL	A-6, A-7	0	0	95-100	91-100	79-97	59-75	39-50	21-29

Map symbol	 Depth	USDA texture	Classi	fication	Frag	ments		rcentag sieve n	_	ng	 Liquid	 Plas
and soil name	 		Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200	limit 	ticit
	In				Pct	Pct		<u> </u>			Pct	Ī
435:	 				l I							
Zook,	ĺ		İ	İ	İ	İ	İ	İ	ĺ	İ	İ	Ì
occasionally					1							
flooded	0-7 	Silty clay loam, silty clay	CH	A-7 	0	0 	100 	100 	98-100 	93-100 	51-68 	22-32
	7-20 	Silty clay loam, silty clay	CH	A-7 	0	0 	100 	100 	94-100 	90-100 	51-68 	22-32
	20-38	Silty clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	86-99	49-65	23-32
	38-61	Silty clay, silty clay	СН	A-7	0	, 0 	100	100	96-100	92-100	50-63	26-32
	61-80	Silty clay loam, silty clay, silt loam	CH, CL	A-6, A-7	0	0	100	100	87-100	83-100	31-56	13-32
Mt. Sterling,	 				ļ		 	 	 	 		
occasionally flooded	0.7	 Silt loam	1 267		0	 0	 100	100		 89-98		110 10
1100ded		Silt loam Silty clay	ML CL	A-6, A-7 A-7, A-6	0	0 0	100	100		89-98 88-100		
	7-26	loam		A-7, A-6	0	0	100	100			20-41	12-21
	26-54	Silty clay loam, silty clay	CH	A-7 	0	0 	100 	100 	95-100 	91-100 	45-57 	25-33
	54-80	Silty clay loam, silty clay	CT	A-7 	0	0	100	100	93-100	89-100 	45-60 	25-35
469C2:	 											
Lamoni,							ļ		ļ		!	
moderately												
eroded	0-6	Clay loam, silty clay	CL	A-7	0	0	94-100	89-100	82-100	74-97	41-56	19-28
	 6-23	Clay loam, clay	CH	 A-7	0	 0	 95_100	 89_100	 69-100	62-94	 42-68	121-40
		Clay loam	CL	A-7, A-6	0	0		90-100				21-27
		Clay loam	CT	A-7, A-6	0	0		91-100				21-27
Clarinda,	 					 					 	
moderately	į	İ	j	j	j	į	İ	İ	İ	İ	į	İ
eroded	0-6	Silty clay loam	CL	A-7	0	0	100	94-100	87-100	84-100	39-56	17-28
	6-80	Clay, silty clay	CH	A-7	0	0	94-100	89-100	79-100	75-100	51-71	29-44
Shelby,												
moderately												
eroded		Clay loam, loam	CL	A-6	0	0				54-77		
		Clay loam	CL	A-6, A-7	0		90-95				39-50	
		Clay loam, loam	CL	A-6, A-7	0	0-4				54-74		
	48-80 	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95 	82-95 	70-92 	55-74	35-47 	17-26
	1	T. Control of the Con	1	1	1	1	1	1	1	1	1	1

Map symbol	Depth	USDA texture	Classi	fication	Frag	ments		rcentag	e passi:	ng	 Liquid	 Plas-
and soil name	· -	İ			>10	3-10	İ					ticity
		1	Unified	AASHTO	inches	inches	4	10	40	200		index
	In				Pct	Pct					Pct	
469C3:						 		 				
Lamoni, severely												
eroded	0-7	Clay loam, silty clay	CL	A-6, A-7	0 	0 	95-100 	90-100 	78-100 	65-86 	40-55 	19-28
	7-14	Clay loam, clay	СН	A-7	0	0	95-100	89-100	67-100	58-90	41-66	21-40
	14-48	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	48-60	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
Clarinda,	 					 	 	 	 		 	
severely eroded	0-4	Silty clay, clay	CH	A-7	0	0	100	94-100	86-100	82-100	53-69	29-40
	4-80	Clay, silty clay	СН	A-7	0	0	94-100	89-100	79-100	75-100	49-69	29-44
Shelby, severely	 					 	 	 	 		 	
eroded	0-2	Clay loam, loam	CL	A-6	0	0	95-100	83-100	70-96	55-77	36-50	16-25
	2-48	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
	48-62	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	81-95	70-92	54-74	35-47	17-26
	62-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
470D2:						 		[
Lamoni,	İ	İ	j	j	j	İ	İ	İ	į	į	į	į
moderately	İ	İ	j	j	j	İ	İ	İ	į	į	į	į
eroded	0-6	Clay loam, silty clay	CL	A-7	0	0	94-100	89-100	82-100	74-97 	41-56	19-28
	6-23	Clay loam, clay	СН	A-7	0	0	95-100	89-100	69-100	62-94	42-68	21-40
	23-55	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	55-80	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
Shelby,						 		[
moderately			İ	İ	İ	ĺ	ĺ	ĺ	İ	İ	İ	İ
eroded	0-7	Clay loam, loam	CL	A-6	0	0	95-100	82-100	70-96	54-77	39-52	16-25
	7-31	Clay loam	CL	A-6, A-7	0	0-5	90-95	81-95	71-91	56-73	39-50	21-27
	31-48	Clay loam, loam	CL	A-6, A-7	0	0 - 4	91-95	81-95	70-92	54-74	35-47	17-26
	48-80	Clay loam, loam	CL	A-6, A-7	0	0-4	91-95	82-95	70-92	55-74	35-47	17-26
545B:												
Zook	0-7	Silty clay loam, silty	CH	A-7	0	0	100	100	98-100	93-100	51-68	22-32
	 7-20	clay Silty clay loam, silty	CH	 A-7	0	 0	100	100	 94-100	90-100	 51-68	 22-32
		clay					į	į				
	20-38 	Silty clay, silty clay loam	CH, CL	A-7 	0	0 	100 	100 	90-100 	86-99 	49-65 	23-32
	38-61	Silty clay, silty clay	СН	A-7	0	0	100	100	96-100	92-100	50-63	26-32
	 61-80	loam Silty clay loam, silty	CH, CL	A-6, A-7	0	 0	100	 100	 87-100	 83-100	 31-56	13-32
		clay, silt loam				 		 				
	ı	I	T	I	1	I	I .	I	I	I	I	1

Map symbol	Depth	USDA texture	Classi	fication	Frag	ments		rcentag	e passi: umber	ng	 Liquid	 Plas-
and soil name	i	İ			>10	3-10	i 					ticity
			Unified	AASHTO	inches	inches	4	10	40	200		index
	In				Pct	Pct					Pct	
545B:	 	 				 	 	 	 	 	 	
Ely	0-8	Silty clay loam, silt	CL	A-7	0	0	100	100	92-100	86-98	43-57	15-24
	İ	loam	j	j	į	İ	į	j	į	į	İ	İ
	8-24	Silty clay loam	CL	A-7	0	0	100	100	92-100	86-98	41-55	15-24
	24-58	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	90-97	39-51	19-25
	58-80	Silt loam, silty clay	CL	A-6	0	0	100	100	89-100	83-100	30-47	12-25
		loam				 					 	
Gullied land.	 	 				 	 	 	 	 	 	
569C:				1				 				
Nira	0-7	Silty clay loam	CH, CL	A-7	0	0	100	100	98-100	96-100	45-53	21-24
	7-11	Silty clay loam	CL	A-7	0	0	100	100	98-100	96-100	43-50	21-24
	11-20	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	20-40	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	98-100	96-100	39-45	21-24
		loam										
	40-80	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	97-100	95-100	35-42	17-21
		loam				 		 	 		 	
Clearfield	0-7	Silty clay loam	CH, CL	A-7	0	0	100	100	97-100	95-100	47-56	22-27
	7-17	Silty clay loam	CH	A-7	0	0	100	100	97-100	95-100	45-54	22-27
	17-54 	Silty clay loam, silty clay	CH	A-7	0	0 	100	100	94-100	93-100	41-52	22-30
	54-71	Silty clay, silty clay loam, clay	CH	A-7	0	0	100	100	84-100	81-100	 47-75 	25-48
		Ioam, Clay										
579E3:		ļ	ļ		ļ			<u> </u>	!			!
Bucknell,												
severely eroded	0-3 	Clay loam, silty clay loam	CT	A-7, A-6 	0	0 	95-100 	90-100 	80-99 	69-86 	37-50 	17-25
	3-12	Clay loam	CH	A-7	0	0	95-100	90-100	79-100	67-88	37-50	19-29
	12-20	Clay	CH	A-7	0		94-100					
		Clay loam	CL	A-6, A-7	0		95-100					
	68-80 	Clay loam	CL	A-6, A-7	0	0 	95-100	91-100	79-97 	59-75	39-50	21-29
Hedrick,								! 				
severely eroded	0-2	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	92-100	91-100	33-45	13-21
-		loam			j							
	2-22	Silty clay loam	CL	A-7	0	0	100	100	97-100	96-100	41-49	22-26
	22-53	Silty clay loam	CL	A-6	0	0	100	100	97-100	96-100	39-46	21-25
	53-74	Silty clay loam, silt	CL	A-7	0	0	100	100	95-100	93-100	35-45	17-24
		loam										
	74-80	Clay loam	CL	A-6, A-7	0	0	95-100	78-100	70-98	59-83	40-49	21-27
		1	I			I	I	I			I	

Map symbol	Depth	USDA texture	Classi	fication	Frag	ments		rcentag	-	-	 Liquid	 Dlag
and soil name	Deptn	USDA texture			 >10	3-10	.]	sieve n	umber		limit	
and soil name	 		 Unified	AASHTO		3-10 inches	4	10	40	200	limic	index
	 In		Unitied	AASHIO	Pct	Pct	<u>*</u> 	10	40	200	Pct	Index
	İ		į	į	j	į	į	į	į	į	į	į
794C2:												
Armstrong,												
moderately												
eroded	0-5 	Silty clay loam, clay loam	CL	A-7 	0	0-5 	90-100	72-100 	65-97 	52-80 	41-51 	19-25
	5-11	Clay loam	CL	A-7	0	0-5	90-100	72-100	64-95	49-74	43-53	25-30
	11-18	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	71-100	54-100	41-82	46-73	26-45
	18-50	Clay loam	CL	A-6	0	0-4	91-100	74-100	65-93	49-72	40-48	21-26
	50-80	Clay loam	CL	A-6	0	0-4	91-100	74-100	64-94	48-73	37-46	19-25
Ladoga,	 							 				
moderately												
eroded	0-7	Silt loam	CL	A-6	0	0	100	100	93-100	92-100	33-51	12-25
	7-49	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	94-100	46-55	25-31
	49-63		CL	A-7	0	0	100	100	 97-100	95-100	37-44	119-23
		Silty clay loam, silt	CL	A-6	0	0	100	100			34-44	
		loam										
822D2:		 						 	 			
Lamoni,	ĺ			İ	į	İ	ĺ	İ	İ	İ	İ	İ
moderately	ĺ			İ	į	İ	ĺ	İ	İ	İ	İ	İ
eroded	0-6	Clay loam, silty clay	CL	A-7	0	0	94-100	89-100	82-100	74-97	41-56	19-28
		loam										
	6-23	Clay loam, clay	CH	A-7	0	0	95-100	89-100	69-100	62-94	42-68	21-40
	23-55	Clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-96	64-79	39-49	21-27
	55-80	Clay loam	CL	A-7, A-6	0	0	95-100	91-100	80-96	64-79	39-49	21-27
870B:	 											
Sharpsburg,												
terrace	0-8	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	94-100	43-53	18-24
	8-17	Silty clay loam	CH, CL	A-7	0	0	100	100	97-100	95-99	43-50	21-24
	17-38	Silty clay loam, silty clay	CL, CH	A-7	0	0	100	100	96-100	95-100	48-57	26-30
	 38-60	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	95-100	94-100	35-46	 17_24
	38-80	loam		A-0, A-/						124-100		- / - 24
					į							

Map symbol	Depth	USDA texture	Classi	fication	_i	ments	Pe		ge passi number	ng		 Plas-
and soil name		 	Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200	limit 	ticity
	In			İ	Pct	Pct		İ	İ	<u> </u>	Pct	İ
870C2:		 				 						
Sharpsburg,												
terrace,												
moderately												1
eroded		Silty clay loam	CH, CL	A-7	0	0	100	100		94-100		
	7-31	Silty clay loam, silty	CL, CH	A-7	0	0	100	100	96-100	95-100	46-55	26-31
	21 50	clay				 0	100	100				
ļ	31-70	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	93-100	92-100	35-50	117-27
I I	70-80	Silty clay loam, silt	CL	A-6, A-7	0	l 0	100	100	98-100	97-100	 35-46	17-24
	70 00	loam					100					-/
870D2:						 					 	
Sharpsburg,		İ	j	j	į	į į		İ	j	İ	į	į
terrace,		İ	İ	ĺ	j	į į		İ	j	İ	İ	İ
moderately												
eroded		Silty clay loam	CH, CL	A-7	0	0	100	100		94-100	1	
	7-31	Silty clay loam, silty clay	CL, CH 	A-7 	0	0 	100	100 	96-100	95-100 	46-55 	26-31
I	31-70	Silty clay loam, silt loam	CL	A-6, A-7	0	0 	100	100	93-100	92-100 	35-50 	17-27
	70-80	Silty clay loam, silt	CL	A-6, A-7	0	0	100	100	98-100	97-100	35-46	17-24
876B:		 				 					 	
Ladoga, terrace		Silt loam	CL	A-6	0	0	100	100		90-100		
		Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100		88-100		
	14-51	Silty clay loam, silty	CH, CL	A-7	0	0	100	100	96-100	95-100	46-55	25-31
		clay						1 100				
	51-60	Silty clay loam, silt loam	CL	A-6 	0	0 	100	100	97-100	96-100 	34-44 	16-23
876C2:						 					 	
Ladoga, terrace,		i	İ	i	į	j		i	i	İ	į	i
moderately		İ	İ	j	j	į i		İ	į	İ	į	i
eroded	0-7	Silt loam	CL	A-6	0	0	100	100	93-100	92-100	33-51	12-25
J	7-49	Silty clay loam, silty	CH, CL	A-7	0	0	100	100	95-100	94-100	46-55	25-31
ļ		clay										
		Silty clay loam	CL	A-7	0	0	100	100		95-100	1	
	63-80	Silty clay loam, silt loam	CL	A-6	0	0 	100	100	98-100	97-100	34-44	16-23

Map symbol	 Depth	USDA texture	Classi	fication	Frag	ments			e passi	ng	 Liquid	
and soil name	 		Unified	AASHTO	>10	3-10 inches	4	10	40	200	limit	ticity index
	In	<u> </u>			Pct	Pct			!		Pct	
876D2:	 	 						 		 	 	
Ladoga, terrace,		į	į	į	į	į		į	į	į	į	į
moderately eroded	 0-7	 Silt loam	 CL	 A -6	0	 0	100	100		100 100	 33-51	
eroded		Silt loam Silty clay loam, silty	CH, CL	A-6 A-7	0	0	100	100			33-51 46-55	
	/- 1 9	clay	CH, CH	A-7	0	0	100	100	33-100			23-31
	49-63	Silty clay loam	CL	A-7	i o	0	100	100	97-100	95-100	37-44	19-23
		Silty clay loam, silt	CL	A-6	i o	0	100	100	98-100	97-100	34-44	16-23
		loam	į	į	į			į	İ	İ	İ	İ
2368B:	 							 		 	 	
Macksburg	0-6	Silty clay loam	CL	A-7	0	0	100	100	99-100	98-100	48-56	21-24
	6-24	Silty clay loam	CL	A-7	0	0	100	100			46-54	
	24-42	Silty clay loam, silty	CH	A-7	0	0	100	100	96-100	95-100	50-59	26-30
		clay	ļ							!		
	42-73	Silt loam, silty clay	CL	A-7, A-6	0	0	100	100	97-100	95-100	38-47	18-23
	 	loam						 	l I	 	 	l I
Nira	0-7	Silty clay loam	CH, CL	A-7	0	0	100	100	98-100	96-100	45-53	21-24
	7-11	Silty clay loam	CL	A-7	0	0	100	100	98-100	96-100	43-50	21-24
	11-20	Silty clay loam	CL	A-7	0	0	100	100	99-100	97-100	42-49	23-27
	20-40	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100 	98-100	96-100 	39-45 	21-24
	40-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100 	97-100	95-100 	35-42 	17-21
5030.	 	ļ		İ	į			į	į	İ	 	İ
Pits, limestone	 		l I		l I	 		i i	İ	l I	 	
quarries	! 			ì	i				İ	İ		İ
_	İ		İ	Ì	į	İ		İ	İ	İ	İ	İ
5040:												
Udorthents,			ļ						!	!		
loamy	0-80	Variable			0		100	100				15-30
5041.	 			}				 	I I	l I	 	l I
Udorthents,	 		l I		l I	 		i i	İ	l I	 	
reclaimed				i								<u> </u>
	İ		i	i				İ	İ	İ	İ	İ
AW.	İ		j	į	j	İ		İ	İ	İ	İ	İ
Animal waste												
lagoon												

			Classif	ication	Frag	ments	Pe	ercentag	e passi	ng		
Map symbol	Depth	USDA texture			I			sieve n	umber		Liquid	Plas-
and soil name					>10	3-10					limit	ticity
			Unified	AASHTO	inches	inches	4	10	40	200		index
	In				Pct	Pct		Ī		1	Pct	Ī
					1							
SL.												
Sewage lagoon					1							
W.					1							
Water	į į			İ	Ĺ	į į		İ	ĺ	Ì	İ	İ
	į į			İ	İ	i i		İ	ĺ	İ	İ	İ

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.

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

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (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	Pct. of	 Depth	 Clay	 Moist	 Saturated	 Available		 Organic	Erosi	on fac	tors	erodi-	Wind erodi
and soil name	map unit			bulk	hydraulic	water	extensi-	matter			<u> </u>	bility	
	<u> </u>	<u> </u>	1	<u> </u>	conductivity	capacity	bility	<u> </u>	Kw	Kf	T	group	index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct					
7 :	l I	 -		 	 			l I			 		
<pre>/: Wiota, rarely flooded</pre>	l 85	 0-8	20-32	 1 20_1 25	1.00-10.00	0.21-0.23	3 0-5 0	3.5-4.5	.32	.32	 5	 7	38
wiota, rarely ilooded	65	0-8 8-28			1.00-10.00	0.21-0.23	1	3.0-4.0	.32	.32	5	'	30
	l I	28-59			1.00-10.00	0.18-0.20		1.0-2.0	.43	.43	l I	l l	1
	I I	59-80			1.00-10.00	0.20-0.22		0.0-1.0	.55	.55	l I	 	
	l I	35-00 	23-34		1.00-10.00	0.20-0.22	3.0-3.5	0.0-1.0	.55	.55	 	 	İ
7B:	l I	 	i	İ	 			i I		i	 	i i	İ
Wiota, rarely flooded	85	0-8	20-32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.5-4.5	.32	.32	5	7	38
,,	i	8-28			1.00-10.00	0.21-0.23		3.0-4.0	.43	.43	-		
	i	28-59			1.00-10.00	0.18-0.20		1.0-2.0	.43	.43	i	i	i
	i	59-80			1.00-10.00	0.20-0.22		0.0-1.0	.55	.55	i	İ	i
	i										i	İ	i
8B:	i	! 	i	i	İ	i	i	İ		i	i	İ	i
Judson	85	0-9	24-32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
		9-28	27-32	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	i	İ	i
	i	28-35			1.00-10.00	0.21-0.23	1	1.0-3.0	.43	.43	i	İ	i
	i	35-60			1.00-10.00	0.21-0.23	1	0.0-1.0	.49	.49	i	İ	i
	i							İ		i	i	İ	i
15B:	İ	İ	i	i	İ	i	i	İ	i	i	i	İ	İ
Olmitz	35	0-7	24-27	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	3.0-4.0	.20	.24	5	6	48
	İ	7-30	22-34	1.40-1.50	1.00-10.00	0.15-0.17	3.0-5.9	2.0-3.0	.28	.32	i	İ	i
	İ	30-60	27-34	1.45-1.55	1.00-10.00	0.14-0.16	3.0-5.9	1.0-2.0	.28	.32	i	İ	i
	İ	İ	i	i		i	i	i	i	i	i	İ	i
Ely	30	0-8	22-34	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	5	4	86
-	İ	8-24	22-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.37	.37	i	İ	İ
	İ	24-58	28-35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.43	.43	İ	İ	İ
	ĺ	58-80	18-35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49	ĺ	Ì	ĺ
	ĺ	ĺ	İ	ĺ	ĺ	İ	İ	ĺ	İ	ĺ	ĺ	Ì	ĺ
Zook	20	0-7	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
	ĺ	7-20	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32	ĺ	Ì	ĺ
	ĺ	20-38	32-45	1.30-1.45	0.10-1.00	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32	ĺ	ĺ	Ì
	ĺ	38-61	36-45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32	ĺ	ĺ	Ì
		61-80	20-45	1.35-1.45	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
16:													
Nodaway, occasionally													
flooded	55	0-7	18-35	1.40-1.50	1.00-10.00	0.22-0.24	3.0-5.9	1.5-2.5	.43	.43	5	6	48
		7-80	18-35	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55			
	 	7-80 	18-35 	1.40-1.50 	1.00-10.00 	0.20-0.22	3.0-5.9	0.0-0.5	.55	. 55	 		

Physical Properties of the Soils--Continued

	Pct. of map unit 	Depth In	Clay 	Moist bulk	Saturated hydraulic	Available		Organic	l			erodi-	erodi-
16:		In	 			water	extensi-	matter		1		hiliter.	bility
	 	In		density	conductivity	capacity	bility	Maccer	Kw	Kf	 T	group	
	 		Pct	g/cc	um/sec	In/in	Pct	Pct	İ	<u> </u>	<u> </u>		İ
Kennebec,			 	 	 		 	 		 	 	 	
	į		İ	İ	İ	İ	İ	İ	İ	İ	į	i	į
occasionally flooded	35	0 - 7	18-30	1.40-1.50	1.00-10.00	0.22-0.24	0.0-2.9	4.0-6.0	.37	.37	5	6	48
ĺ	ĺ	7-16	18-32	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.5-5.5	.37	.37	İ	İ	İ
		16-35	18-32	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	2.0-4.0	.43	.43			
		35-48	1		1.00-10.00	0.18-0.20		1.0-2.0	.43	.43			
		48-80	24-30	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.49	.49			
24C2:				 	 		 						
Shelby, moderately													
eroded	85	0 - 7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
		7-31	1		1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32			
		31-48	1		1.00-10.00	0.14-0.19		0.0-0.5	.28	.37			
		48-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.24	.32			
24D2:				 	 		 						
Shelby, moderately													
eroded	70	0 - 7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
		7-31	30-38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32			
		31-48	1		1.00-10.00	0.14-0.19		0.0-0.5	.28	.37			
		48-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.24	.32			
24E:				 	 		 						
Shelby	60	0 - 7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	3.0-4.0	.20	.24	5	6	48
	J	7-11	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.0-3.0	.20	.24			
		11-46			1.00-10.00	0.15-0.17		0.0-1.0	.24	.32			
		46-60	1		1.00-10.00	0.14-0.19		0.0-0.5	.28	.37			
		60-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			
24E2:	i i			 	 		 	 			i		
Shelby, moderately													
eroded	65	0-7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
	J	7-31	30-38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32			
		31-48	25-36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			
		48-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.24	.32			
24F:			 	 	 		 	 					
Shelby	65	0-7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	3.0-4.0	.20	.24	5	6	48
İ	ĺ	7-11	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.0-3.0	.20	.24			
		11-46	30-38	1.55-1.65	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32			
		46-60	1		1.00-10.00	0.14-0.19		0.0-0.5	.28	.37			
		60-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			

Physical Properties of the Soils--Continued

Map symbol	Pct. of	 Depth	 Clay	Moist	Saturated	Available		Organic	Erosi	on fac	tors	erodi-	Wind erodi-
and soil name	map unit		 	bulk density	hydraulic conductivity	water capacity	extensi-	matter	 Kw	 Kf	 T	group	bility index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct	<u> </u>	<u> </u>	İ		İ
43:	 		 	 	 		 	 		 	 		
Bremer, rarely	j	İ	i	İ	İ	i	į	į	i	i	i	i	i
flooded	85	0-8	27-36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.28	.28	5	7	38
	j	8-19	27-36	1.30-1.35	1.00-10.00	0.21-0.23	0.0-2.9	5.0-7.0	.37	.37	i	i	i
	į į	19-42	35-45	1.30-1.45	1.00-10.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37	İ	İ	İ
	į į	42-50	30-40	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43	İ	İ	İ
		50-60	25-40	1.40-1.50	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43	į	į	į
45B:		 									 		
Zook	75	0-7	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
		7-20	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32			
		20-38	32-45	1.30-1.45	0.10-1.00	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
		38-61	36-45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32	ĺ	ĺ	İ
		61-80	20-45	1.35-1.45	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49	İ		Ì
Ely	20	0 - 8	22-34	 1.30-1.35	 1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.32	.32	 5	 7	38
		8-24	22-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.37	.37			
		24-58	28-35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.43	.43			
		58-80	18-35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49			
54:													
Zook, occasionally													
flooded	90	0-7	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
		7-20			0.10-1.00	0.21-0.23		5.0-7.0	.32	.32			
		20-38	32-45	1.30-1.45	0.10-1.00	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32			
		38-61		1	0.10-1.00	0.18-0.20	1	2.0-4.0	.32	.32			
	 	61-80 	20-45	1.35-1.45	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49	 		
54+:				į	İ			į			į		į
Zook, occasionally			!	!	!					!	ļ	!	!
flooded, overwash	80	0-7			1.00-10.00	0.22-0.24		2.0-4.0	.43	.43	5	6	48
		7-13			1.00-10.00	0.22-0.24	1	2.0-4.0	.49	.49	ļ	ļ	
		13-50	1	1	0.10-1.00	0.21-0.23	1	3.0-5.0	.32	.32	ļ	ļ	
		50-58		1	0.10-1.00	0.18-0.20		2.0-4.0	.32	.32	ļ	ļ	
	 	58-80 	20-45 	1.30-1.45 	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49 	 		
76B:	İ		İ	İ	İ	İ	İ	İ	İ	İ	Ì	İ	İ
Ladoga	95	0-7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
-		7-14	15-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	0.5-1.0	.55	.55	İ	İ	İ
	İ	14-51	35-42	1.30-1.40	1.00-10.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	Ì	İ	İ
		51-60	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	İ	İ	İ
	İ		i	İ	İ	i	İ	į	i	i	İ	İ	İ

Physical Properties of the Soils--Continued

Mary 2000 1	D			1 20 1			 		Erosi	on fac	tors		Wind
Map symbol	Pct. of	Depth	Clay	Moist	Saturated	Available water		Organic		1	1		erodi
and soil name	map unit	 	 	bulk	hydraulic conductivity	capacity	extensi- bility	matter	 Kw	 Kf	 •••	group	bility
		In	Pct	g/cc	um/sec	In/in	Pct	Pct	ICW		-	 	
76C:													
Ladoga	75	 0-7	 18_35	 1 45_1 55	1.00-10.00	0.22-0.24	 3 0_5 9	2.5-3.5	.37	.37	 5	 6	48
nadoga	73	0-7 7-14		1	1.00-10.00	0.22-0.24	1	0.5-1.0	.55	.55]	1	40
		14-51	1	1	1.00-10.00	0.18-0.20	1	0.5-1.0	37	37	i	 	
		51-60			1.00-10.00	0.20-0.22		0.0-0.5	.55	.55			
76D:		 	 	 	 		 						
Ladoga	85	0-7	18-35	 1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
		7-14			1.00-10.00	0.22-0.24		0.5-1.0	.55	.55	1	-	
		14-51		1	1.00-10.00	0.18-0.20		0.5-1.0	.37	.37	i	i	i
		51-60	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	į		
76D2:		 	 	 	 		 			 	 		
Ladoga, moderately		İ	i	İ	İ	i	İ	i	i	i	i	İ	i
eroded	60	0-7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.0-3.0	.43	.43	5	6	48
i		7-49	35-42	1.35-1.45	1.00-10.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	İ	İ	i
		49-63	27-32	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49	İ	İ	i
		63-80	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	į	į	į
86:		 		 	 		 			 			
Mt. Sterling,													
occasionally flooded	60	0-7	18-27	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-3.0	.37	.37	5	6	48
		7-26	18-30	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.5-1.0	.37	.37			
		26-54	35-45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	0.0-1.0	.28	.28			
		54-80	35-48	1.30-1.35	0.10-1.00	0.10-0.12	6.0-8.9	0.0-1.0	.28	.28			
Zook, occasionally		 											
flooded, overwash	25	0-7	1	1	1.00-10.00	0.22-0.24	1	2.0-4.0	.43	.43	5	6	48
		7-13			1.00-10.00	0.22-0.24		2.0-4.0	.49	.49			
		13-50	1	1	0.10-1.00	0.21-0.23		3.0-5.0	.32	.32			
		50-58			0.10-1.00	0.18-0.20		2.0-4.0	.32	.32	!	ļ	
		58-80 	20-45	1.30-1.45 	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49	l I		
88:		İ	į	į	į	į	į	į	į	į	į	į	į
Nevin, rarely flooded	90	0-8			1.00-10.00	0.22-0.24		4.0-6.0	.32	.32	5	6	48
		8-30		1	1.00-10.00	0.21-0.23	1	4.0-6.0	.37	.37	ļ	ļ	
		30-46			1.00-10.00	0.18-0.20		1.0-2.0	.43	.43	!	ļ	
		46-62 	25-36 	1.40-1.50 	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49 	l I		
93D2:		İ	į	į	į	į	į	į	į	į	į	į	į
Shelby, moderately			[ļ.	[1	ļ.						
eroded	35	0-7		1	1.00-10.00	0.17-0.19	1	2.2-3.2	.24	.24	5	6	48
		7-31		1	1.00-10.00	0.15-0.17	1	0.0-1.0	.24	.32			
		31-48		1	1.00-10.00	0.14-0.19		0.0-0.5	.28	.37	ļ		
		48-80			1.00-10.00	0.14-0.19		0.0-0.5	.24	.32			

Physical Properties of the Soils--Continued

Map symbol	Pct. of	Depth	Clay	 Moist	Saturated	Available		Organic	Erosi	on fac	tors	erodi-	
and soil name	map unit			bulk	hydraulic	water	extensi-	matter		ļ	!	bility	
				density	conductivity	capacity	bility		Kw	Kf	T	group	index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct		l I	 		l I
93D2:			 										
Adair, moderately													
eroded	25	0 - 7	24-40	1.45-1.55	0.10-1.00	0.17-0.19	3.0-5.0	2.2-3.2	.28	.28	3	6	48
		7-17	38-60	1.25-1.40	0.10-1.00	0.09-0.11	6.0-11.2	0.5-1.0	.20	.24			
		17-60	30-38	1.50-1.60	0.10-1.00	0.15-0.17	3.0-5.9	0.0-0.5	.28	.37			
		60-76	30-38	1.55-1.65	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.28	.37			
		76-80	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37			
93E2:			 	 			 			 	 	 	1
Shelby, moderately	i		! 	i		i			i	i	i	i	i
eroded	45	0-7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
		7-31		1	1.00-10.00	0.15-0.17		0.0-1.0	.24	.32	-	-	
		31-48		1	1.00-10.00	0.14-0.19		0.0-0.5	.28	.37	İ	İ	i
		48-80		1	1.00-10.00	0.14-0.19		0.0-0.5	.24	.32	İ	İ	İ
Adair, moderately eroded	 30	0-7	 24_40	 1 45_1 55	0.10-1.00	0.17-0.19	3 0-5 0	2.2-3.2	.28	.28	 3	 6	48
eroded	30	7-17			0.10-1.00	1	6.0-11.2		.20	.24	1	"	1 40
		17-60		1	0.10-1.00	0.15-0.17		0.0-0.5	.28	.37	l I	 	
		60-76			0.10-1.00	0.13-0.17		0.0-0.5	.28	37	 	l I	
		76-80		1	0.10-1.00	0.14-0.16		0.0-0.5	.32	37	 	l I	
		/6-80	30-38 	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.3/	l I	l I	1
172:													
Wabash, frequently ponded, occasionally	į			i I					į	į	 	į	į
flooded	 90	0-6	 40-60	 1 25_1 40	0.01-0.10	0 12-0 14	 9.0-11.9	4 0-6 0	.20	.20	 5	4	86
1100ded	50	6-19		1	0.01-0.10	1	9.0-11.9		.28	.28]	*	00
		19-60			0.01-0.10	1	9.0-11.9		.28	.28	l I	l I	i
		15 00	10 00		0.01 0.10		3.0 11.5	1.0 2.0	.20	.20	İ		i
179E:				İ			i i		İ	İ	İ	İ	i
Gara	60	0 - 7	12-35	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	2.5-3.5	.28	.28	5	6	48
		7-12	18-35	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.28	.28			
		12-45	25-35	1.55-1.65	1.00-10.00	0.15-0.19	3.0-5.9	0.0-1.0	.28	.32			
		45-80	24-35	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			
179F:			 	 							 		
Gara	65	0 - 7	12-35	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	2.5-3.5	.28	.28	5	6	48
	i i	7-12	18-35	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.28	.28	İ	İ	İ
	i	12-45	25-35	1.55-1.65	1.00-10.00	0.15-0.19	3.0-5.9	0.0-1.0	.28	.32	İ	Ì	İ
		45-80	24-35	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37	į	į	į
179G:			 	 							 		
Gara	70	0-7	12-35	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	2.5-3.5	.28	.28	5	6	48
	i	7-12			1.00-10.00	0.20-0.22	3.0-5.9	1.0-2.0	.28	.28	İ	İ	Ì
	į i	12-45			1.00-10.00	0.15-0.19		0.0-1.0	.28	.32	i	İ	İ
	i	45-80	24-35	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37	i	İ	į
	i			i		i	i		i	i	i	i	i

Physical Properties of the Soils--Continued

Map symbol	Pct. of	 Depth	 Clay	 Moist	 Saturated	Available	Linear	 Organic	Erosi	on fac	tors	Wind erodi-	Wind
and soil name	map unit	Depth	Clay	bulk	hydraulic	water	extensi-	matter	ļ	ı .		bility	1
and soll name	map anic	 		1	conductivity	capacity	bility	Maccer	Kw	Kf	T	group	
		In	Pct	g/cc	um/sec	In/in	Pct	Pct	İ	İ	İ		İ
192D2:		 	 		 					l I	 	 	
Adair, moderately		 		i	İ			! 	i	i	i	i	i
eroded	55	0-7	24-40	1.45-1.55	0.10-1.00	0.17-0.19	3.0-5.0	2.2-3.2	.28	.28	3	6	48
		7-17		1	0.10-1.00	0.09-0.11	6.0-11.2	0.5-1.0	.20	.24	i		i
	İ	17-60			0.10-1.00	0.15-0.17	3.0-5.9	0.0-0.5	.28	.37	i	i	i
		60-76			0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.28	.37	i	i	i
		76-80	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37	į	į	į
220:		 		 	 			 		 	 	 	
Nodaway, occasionally	İ	İ	İ	İ	İ	İ	İ	İ	İ	İ	İ	İ	İ
flooded	80	0-7	18-35	1.40-1.50	1.00-10.00	0.22-0.24	3.0-5.9	1.5-2.5	.43	.43	5	6	48
		7-80	18-35	1.40-1.50	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	į	į	į
222C2:		 			 						 		
Clarinda, moderately		ĺ	İ	İ	ĺ	İ			İ	ĺ	ĺ	İ	ĺ
eroded	75	0-6	25-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	7	38
		6-80	40-60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.28	.32			
222D:								 					
Clarinda	75	0-5	25-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	3	7	38
		5-11	25-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32			
		11-19	40-55	1.30-1.40	0.01-0.10	0.11-0.13	6.0-8.9	0.5-1.0	.32	.32			
		19-67	40-60	1.30-1.40	0.01-0.10	0.08-0.10	9.0-11.9	0.0-0.5	.28	.28			
222D2:								 					
Clarinda, moderately													
eroded	70	0-6		1	1.00-10.00	0.21-0.23		2.2-3.2	.37	.37	3	6	38
		6-80 	40-60 	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.28	.32	 		
222D3:		į	į	į	į					į	ļ		į
Clarinda, severely													
eroded	70	0-4		1	0.01-0.10	0.12-0.14		1.7-2.7	.24	.24	2	4	86
		4-80	40-60 	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.28	32	 		
248:		į	į	i	İ	İ	İ	İ	į	İ	į	i	İ
Wabash, occasionally ponded,		 		İ		İ		 		İ			İ
occasionally		I I	I I		 			 					1
flooded	l 85	 0-7	 35_40	 1 35_1 EA	0.01-0.10	0 21-0 23	6.0-8.9	4.0-6.0	1 .28	.28	 5	 4	86
1100464	05	0-7 7-15		1	0.01-0.10	0.21-0.23		4.0-6.0	37	.37		4	00
		15-36		1	0.01-0.10		9.0-11.9		.24	.24		1	I I
		36-80		1	0.01-0.10		9.0-11.9		.28	.28		i	İ
			-3 50							.20		i	

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of	Depth	 Clay 	 Moist bulk	 Saturated hvdraulic	 Available water	 Linear extensi-	 Organic matter	ETOS10	on fac	 	erodi-	Wind erodi- bility
una 2011 numo	map and			density	conductivity	capacity	bility		Kw	Kf	т	group	
		In	Pct	g/cc	um/sec	In/in	Pct	Pct	<u> </u>	İ	İ	<u> </u>	
269:				 	 			 			 		
Humeston,	ĺ			ĺ	ĺ		ĺ	ĺ	İ	ĺ	ĺ	ĺ	İ
occasionally flooded	100	0 - 8	24-30	1.35-1.45	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.37	.37	5	6	48
	j	8-13	24-30	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	3.0-4.0	.43	.43	ĺ	ĺ	İ
		13-22	20-26	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-2.0	.49	.49			
		22-26	30-35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43			
I		26-50	35-48	1.30-1.50	0.01-0.10	0.13-0.18	6.0-8.9	1.0-1.5	.37	.37			
		50-60	30-38	1.40-1.50	0.01-0.10	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
273B:					 	 		 					
Olmitz	80	0 - 7	24-27	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	3.0-4.0	.20	.24	5	6	48
I		7-30	22-34	1.40-1.50	1.00-10.00	0.15-0.17	3.0-5.9	2.0-3.0	.28	.32			
		30-60	27-34	1.45-1.55	1.00-10.00	0.14-0.16	3.0-5.9	1.0-2.0	.28	.32			
273C:				 	 	 		 		 			
Olmitz	75	0 - 7	24-27	1.50-1.55	1.00-10.00	0.20-0.22	3.0-5.9	3.0-4.0	.20	.24	5	6	48
		7-30	22-34	1.40-1.50	1.00-10.00	0.15-0.17	3.0-5.9	2.0-3.0	.28	.32			
		30-60	27-34	1.45-1.55	1.00-10.00	0.14-0.16	3.0-5.9	1.0-2.0	.28	.32			
324C2:				 	 	 		 			 		
Dickman, moderately													
eroded	90	0 - 6	10-18	1.50-1.60	10.00-100.00	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	5	3	86
I		6-19	10-18	1.50-1.60	10.00-100.00	0.15-0.17	0.0-2.9	0.0-1.0	.28	.28			
I		19-46	4-10	1.55-1.65	100.00-705.00	0.09-0.11	0.0-2.9	0.0-0.5	.28	.28			
I		46-56	10-18	1.55-1.65	10.00-100.00	0.14-0.16	0.0-2.9	0.0-0.5	.20	.28			
I		56-69	4-10	1.60-1.70	100.00-705.00	0.05-0.07	0.0-2.9	0.0-0.5	.20	.20			
		69-80	20-30	1.45-1.55	10.00-100.00	0.20-0.22	0.0-2.9	0.0-0.5	.55	.55			
324D2:						 		! 					
Dickman, moderately													
eroded	90	0 - 6		1	10.00-100.00		1	1.0-2.0	.28	.28	5	3	86
		6-19		1	10.00-100.00	1	1	0.0-1.0	.28	.28			
		19-46		1	100.00-705.00		1	0.0-0.5	.28	.28			
		46-56			10.00-100.00			0.0-0.5	.20	.28			
		56-69		1	100.00-705.00		1	0.0-0.5	.20	.20	!		
		69-80	20-30 	1.45-1.55 	10.00-100.00	0.20-0.22	0.0-2.9	0.0-0.5	.55	.55	 	 	
354.				İ	İ					İ	İ	İ	
Aquolls, ponded			 			 		 					
368:			 	 	! 	! 		! 					
Macksburg	85	0 - 6	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	4.5-5.5	.32	.32	5	7	38
I		6-24	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.5-4.5	.37	.37			
I		24-42		1		0.18-0.20	6.0-8.9	2.0-3.0	.32	.32			
		42-73	0.00		1.00-10.00		3.0-5.9	1.0-2.0	.49	.49	1	1	1

Physical Properties of the Soils--Continued

Map symbol	Pct. of	Depth	 Clay	 Moist	 Saturated	 Available	 Linear	 Organic	Erosi	on fact	cors	Wind erodi-	Wind erodi
and soil name	map unit			bulk	hydraulic	water	extensi-	matter				bility	bilit
İ	- i		j	density	conductivity	capacity	bility	j	Kw	Kf	т	group	index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct				ļ.	Ţ.
369:			 	 	 		 	 		 			
Winterset	100	0-7	28-35	1.30-1.40	1.00-10.00	0.21-0.23	0.0-2.9	5.0-6.0	.28	.28	5	7	38
i	į	7-19	32-36	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.32	.32		i	İ
i	i	19-58	36-42	1.30-1.40	1.00-10.00	0.18-0.20	6.0-8.9	1.0-3.0	.37	.37		i	i
	į	58-69	25-35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49		į	į
370:			 	 	 		 	 		 		 	
Sharpsburg	95	0-8	27-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
i	i	8-17	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.0	.37	.37		i	i
i	i	17-38	36-42	1.35-1.40	1.00-10.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37		i	i
	į	38-60	25-34	1.40-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49		į	į
370B:			 	 	 		 	 		 			
Sharpsburg	95	0 - 8	27-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
i	i	8-17	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.0	.37	.37		i	i
i	i	17-38	36-42	1.35-1.40	1.00-10.00	0.18-0.20	6.0-8.9	1.0-2.0	.37	.37		i	i
	į	38-60	25-34	1.40-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49		į	į
371C2:			 	 	 		 	 		 			
Sharpsburg,	i		İ	i	İ	i	į	İ	i	i		i	i
moderately eroded	35	0-7	27-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.32	.32	5	7	38
- i	i	7-31	36-42	1.35-1.40	1.00-10.00	0.18-0.20	6.0-8.9	0.0-1.0	.37	.37		i	i
i	i	31-70	25-38	1.35-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49		i	i
	į	70-80	25-34	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-1.0	.55	.55		į	į
Nira, moderately			 	 	 		 	 		 			
eroded	30	0-7	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.28	.28	5	7	38
İ	ĺ	7-12	33-38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43		İ	İ
İ	ĺ	12-45	30-34	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43		İ	İ
	į	45-80	25-30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			Ì
371D2:			 		 			 					
Sharpsburg,													
moderately eroded	50	0 - 7	27-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.32	.32	5	7	38
		7-31	36-42	1.35-1.40	1.00-10.00	0.18-0.20	6.0-8.9	0.0-1.0	.37	.37			
		31-70	25-38	1.35-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
		70-80	25-34	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-1.0	.55	.55			
Nira, moderately			 		 			! 					
eroded	20	0-7	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.28	.28	5	7	38
İ	ĺ	7-12	33-38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
İ	ĺ	12-45	30-34	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
		45-80			1.00-10.00	0.18-0.20		0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol	Pct. of	Depth	Clay	 Moist	Saturated	 Available		Organic	Erosi	on fac	cors	erodi-	Wind erodi
and soil name	map unit		 	bulk density	hydraulic conductivity	water capacity	extensi- bility	matter	 Kw	 Kf	 T	bility group	
		In	Pct	g/cc	um/sec	In/in	Pct	Pct	<u> </u>		<u> </u>		İ
421C2:			 	 			 	 		 	 	 	
Gara, moderately													
eroded	35	0-5			1.00-10.00	0.17-0.18		2.0-3.0	.24	.24	5	6	48
		5-43			1.00-10.00	0.15-0.17		0.0-1.0	.28	.32			1
		43-62			1.00-10.00	0.14-0.19		0.0-0.5	.28	.32		ļ	!
		62-80	24-35 	1.60-1.70 	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37	 		
Bucknell, moderately			İ						İ	İ			İ
eroded	35	0 - 7			1.00-10.00	0.21-0.23		2.2-3.2	.32	.37	3	7	38
		7-34			0.10-1.00	0.09-0.11		0.0-0.5	.28	.28			
		34-71			0.10-1.00	0.14-0.16		0.0-0.5	.32	.32			1
		71-80	30-40	1.60-1.70 	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32	 	 	
421D2:			İ									İ	
Gara, moderately													
eroded	35	0-5	12-35	1.45-1.55	1.00-10.00	0.17-0.18	3.0-5.9	2.0-3.0	.24	.24	5	6	48
		5-43			1.00-10.00	0.15-0.17		0.0-1.0	.28	.32			
		43-62			1.00-10.00	0.14-0.19		0.0-0.5	.28	.32			
		62-80	24-35	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37	 		
Bucknell, moderately			İ	 			! 	! 				İ	
eroded	30	0 - 7	25-35	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.32	.37	3	7	38
		7-34	40-50	1.35-1.45	0.10-1.00	0.09-0.11		0.0-0.5	.28	.28			
		34-71			0.10-1.00	0.14-0.16		0.0-0.5	.32	.32			
		71-80	30-40	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32	 		
421E2:			! 	 			 	 					
Gara, moderately													
eroded	40	0-5	12-35	1.45-1.55	1.00-10.00	0.17-0.18	3.0-5.9	2.0-3.0	.24	.24	5	6	48
		5-43			1.00-10.00	0.15-0.17		0.0-1.0	.28	.32			
		43-62			1.00-10.00	0.14-0.19		0.0-0.5	.28	.32			1
		62-80	24-35	1.60-1.70 	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37	 	 	
Bucknell, moderately			İ	 			! 	! 				İ	
eroded	25	0 - 7			1.00-10.00	0.21-0.23		2.2-3.2	.32	.37	3	7	38
		7-34			0.10-1.00	0.09-0.11		0.0-0.5	.28	.28			
		34-71		1.50-1.60		0.14-0.16		0.0-0.5	.32	.32			1
		71-80	30-40	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32	 		
435:				! 			 						
Zook, occasionally													
flooded	40	0 - 7	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
		7-20		1.30-1.35		0.21-0.23		5.0-7.0	.32	.32			
		20-38		1.30-1.45		0.11-0.13		3.0-5.0	.32	.32			
		38-61			0.10-1.00	0.18-0.20		2.0-4.0	.32	.32			!
		61-80	20-45	1.35-1.45	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			

Physical Properties of the Soils--Continued

Map symbol	Pct. of	 Depth	 Clav	 Moist	 Saturated	Available	Linear	Organic	Erosı	on fac	tors		Wind
map symbol and soil name	map unit	Deptn	Clay	Moist bulk	hvdraulic	Available water	extensi-	matter	ļ	1	1	erodi-	1
and soil name	map unit	l I	l I	1	conductivity	capacity	bility	matter	 Kw	Kf	 m	group	1
	<u> </u>	 In	Pct	q/cc	um/sec	In/in	Pct	Pct	100	1	 -	group	
		i				,			İ	i	i	İ	i
435:		į	į	į	İ	j	j		j	į	į	j	İ
Mt. Sterling,													
occasionally flooded	35	0 - 7	18-27	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	1.0-3.0	.37	.37	5	6	48
		7-26		1	1.00-10.00	0.20-0.22		0.5-1.0	.37	.37			
		26-54		1	0.10-1.00	0.18-0.20		0.0-1.0	.28	.28			
		54-80 	35-48	1.30-1.35	0.10-1.00	0.10-0.12	6.0-8.9	0.0-1.0	.28	.28	 	 	
469C2:		İ	İ	İ	İ								
Lamoni, moderately													
eroded	35	0-6		1	1.00-10.00	0.21-0.23		2.2-3.2	.28	.32	3	7	38
		6-23		1	0.10-1.00	0.09-0.11		0.5-2.0	.24	.28			
		23-55		1	0.10-1.00	0.15-0.17		0.0-0.5	.32	.37			
		55-80	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37			
Clarinda, moderately													
eroded	30	0-6	25-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.37	.37	3	7	38
		6-80	40-60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.28	.32			
Shelby, moderately		 	 	 	 		 				 		
eroded	20	0-7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
		7-31	30-38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32	ĺ	ĺ	İ
		31-48	25-36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			
		48-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.24	.32			
469C3:		 	 	 			 				 	 	
Lamoni, severely		į	i	į	İ	İ	İ		İ	i	į	İ	İ
eroded	35	0-7	27-40	1.40-1.50	0.10-1.00	0.17-0.19	3.0-5.9	1.7-2.7	.24	.28	2	7	48
		7-14	30-55	1.25-1.40	0.10-1.00	0.09-0.11	6.0-8.9	0.2-1.0	.24	.28			
		14-48	30-38	1.50-1.60	0.10-1.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.37			
		48-60	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37			
Clarinda, severely		 	 	 							 		
eroded	30	0-4	40-55	1.30-1.40	0.01-0.10	0.12-0.14	6.0-8.9	1.7-2.7	.24	.24	2	4	86
		4-80	40-60	1.30-1.40	0.01-0.10	0.08-0.12	9.0-11.9	0.0-0.5	.28	.32	į	į	į
Shelby, severely		 		 	 		 				 		
eroded	20	0-2	24-35	1.50-1.60	1.00-10.00	0.17-0.19	3.0-5.9	1.2-2.2	.24	.24	4	6	48
		2-48			1.00-10.00	0.15-0.17		0.0-1.0	.24	.32	i	i -	į
i		48-62		1	1.00-10.00	0.14-0.19		0.0-0.5	.28	.37	i	i	i
		62-80		1	1.00-10.00	0.14-0.19		0.0-0.5	.28	.37	i	i	i
		İ	i	i	j	İ				į	į	į	į

Physical Properties of the Soils--Continued

Map symbol	 Pct. of	Depth	 Clay	 Moist	Saturated	 Available		 Organic	Erosi	on fact	ors	erodi-	1
and soil name	map unit			bulk	hydraulic	water	extensi-	matter				bility	
				density	conductivity	capacity	bility		Kw	Kf	Т	group	index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct					
170D2:	 			 									
Lamoni, moderately													
eroded	40	0-6	27-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.28	.32	3	7	38
		6-23	1		0.10-1.00	0.09-0.11	6.0-8.9	0.5-2.0	.24	.28			
		23-55	30-38	1.50-1.60	0.10-1.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.37			
		55-80	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37			
Shelby, moderately	 			 									
eroded	35	0 - 7	24-35	1.45-1.55	1.00-10.00	0.17-0.19	3.0-5.9	2.2-3.2	.24	.24	5	6	48
		7-31	30-38	1.50-1.60	1.00-10.00	0.15-0.17	3.0-5.9	0.0-1.0	.24	.32			
		31-48	25-36	1.55-1.65	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.28	.37			
		48-80	25-36	1.60-1.70	1.00-10.00	0.14-0.19	3.0-5.9	0.0-0.5	.24	.32			
545B:				 									
Zook	35	0-7	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
	İ	7-20	32-45	1.30-1.35	0.10-1.00	0.21-0.23	3.0-5.9	5.0-7.0	.32	.32		ĺ	ĺ
	İ	20-38	32-45	1.30-1.45	0.10-1.00	0.11-0.13	6.0-8.9	3.0-5.0	.32	.32		ĺ	İ
	İ	38-61	36-45	1.30-1.45	0.10-1.00	0.18-0.20	6.0-8.9	2.0-4.0	.32	.32		ĺ	İ
		61-80	20-45	1.35-1.45	0.10-1.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49			
Ely	 30	0-8	22-34	 1.30-1.35	 1.00-10.00	0.21-0.23	0.0-2.9	 5.0-6.0	.32	.32	5	 7	38
_	į į	8-24	22-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	4.0-5.0	.37	.37		İ	İ
	i i	24-58	28-35	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	1.0-3.0	.43	.43		į	i
		58-80	18-35	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.5-1.0	.49	.49		İ	į
Gullied land	 20		 	 			 			 	-		
569C:	 		 	 			 			 			
Nira	45	0-7	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
	į į	7-11	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32		İ	İ
	į į	11-20	33-38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43		İ	İ
	İ	20-40	25-34	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49		ĺ	ĺ
	ļ	40-80	25-30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.55	.55			
Clearfield	 35	0-7	32-38	 1.30-1.40	 1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	4	4	 86
	į į	7-17	32-38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	2.0-3.0	.37	.37		İ	İ
	į i	17-54	32-42	1.30-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43		İ	İ
	i	54-71	35-65	1 30-1 40	0.01-0.10	0 10-0 12	9.0-11.9	0.0-0.5	.28	.28		i	i

Physical Properties of the Soils--Continued

Map symbol	Pct. of	Depth	 Clay	 Moist	 Saturated	Available	 Linear	 Organic	Erosi	on fac	tors	Wind erodi-	Wind
and soil name	map unit	рерсп	Clay	Moist bulk	hvdraulic	water	extensi-	matter				bility	
and soll name	map unic		l İ		conductivity	capacity	bility	Matter	 Kw	 Kf	T	group	1
		In	Pct	g/cc	um/sec	In/in	Pct	Pct			-		
579E3:				 				 		 		 	
Bucknell, severely	i		i		İ	i	İ	İ	i	İ	i	İ	i
eroded	55	0-3	25-35	1.45-1.55	0.10-1.00	0.17-0.19	3.0-5.9	1.2-2.2	.32	.32	2	6	48
		3-12	27-40	1.45-1.55	0.10-1.00	0.17-0.19	3.0-5.9	0.0-0.5	.28	.32	i	İ	
i	i	12-20	40-50	1.30-1.40	0.10-1.00	0.09-0.11	6.0-8.9	0.0-0.5	.28	.28	İ	İ	İ
i	i	20-68	28-40	1.50-1.60	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37	İ	İ	İ
	į	68-80	30-40	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32	į	į	į
Hedrick, severely	 		 	 	 		 	 		 	 	 	
eroded	35	0-2	20-30	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	1.0-2.0	.32	.32	4	7	38
İ	į	2-22	32-37	1.30-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43	i	į	i
İ	į	22-53	30-35	1.30-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43	i	į	i
İ	į	53-74	25-34	1.40-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43	i	į	i
	į	74-80	30-40	1.50-1.60	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32	į	į	į
794C2:	 			 	 			 		 		 	
Armstrong, moderately	İ		İ	İ	İ	İ	İ	İ	İ	İ	İ	į	İ
eroded	65	0-5	27-35	1.45-1.50	0.10-1.00	0.17-0.19	3.0-5.9	2.0-3.0	.24	.28	3	6	48
İ	İ	5-11	35-42	1.45-1.50	0.10-1.00	0.15-0.17	3.0-5.9	0.0-1.0	.17	.24	İ	į	İ
	İ	11-18	36-60	1.25-1.40	0.10-1.00	0.09-0.11	6.0-8.9	0.0-1.0	.17	.24	İ	į	İ
	ĺ	18-50	30-36	1.55-1.65	0.10-1.00	0.14-0.16	3.0-5.9	0.0-1.0	.28	.32	ĺ	ĺ	İ
	ĺ	50-80	27-35	1.55-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.28	.37	İ		İ
Ladoga, moderately			 	 	 			 		 		 	
eroded	30	0 - 7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.0-3.0	.43	.43	5	6	48
		7-49	35-42	1.35-1.45	1.00-10.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37			
		49-63	27-32	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
		63-80	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55			
822D2:				 	 			 		 			
Lamoni, moderately													
eroded	55	0 - 6	27-40	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.2-3.2	.28	.32	3	7	38
		6-23	30-55	1.25-1.40	0.10-1.00	0.09-0.11	6.0-8.9	0.5-2.0	.24	.28			
		23-55	30-38	1.50-1.60	0.10-1.00	0.15-0.17	3.0-5.9	0.0-0.5	.32	.37			
		55-80	30-38	1.60-1.70	0.10-1.00	0.14-0.16	3.0-5.9	0.0-0.5	.32	.37			
870B:				 									
Sharpsburg, terrace	85	8 - 0			1.00-10.00	0.21-0.23		3.0-4.0	.32	.32	5	7	38
		8-17		1.30-1.40	1	0.21-0.23	1	2.0-3.0	.37	.37			
		17-38		1.35-1.40		0.18-0.20		1.0-2.0	.37	.37			
		38-60	25-34	1.40-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49		I	

Physical Properties of the Soils--Continued

Pct. of	Depth	Clay	Moist bulk	Saturated hvdraulic	Available water	Linear	Organic matter		I			erodi-
			density	1 2	1	bility		Kw	Kf	т		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct	 		İ		
l I		 	l I	 	1	 	 		i	l		1
85 I	0 - 7	27-34	 1.30-1.35	1 1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.32	.32		7	38
				1	1	1		.37	.37		i '	
i	31-70				1			.49	.49	i	i	i
į	70-80				1	1	0.0-1.0	.55	.55	į		
				 			 		 		1	
i				! 			i I		i	i	i	
75	0 - 7	27-34	1.30-1.35	1.00-10.00	0.21-0.23	3.0-5.9	2.7-3.7	.32	.32	5	7	38
į	7-31	36-42	1.35-1.40	1.00-10.00	0.18-0.20	6.0-8.9	0.0-1.0	.37	.37	İ	i	i
i	31-70	25-38	1.35-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-1.0	.49	.49	i	i	i
į	70-80	25-34	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-1.0	.55	.55	į	į	į
100	0 - 7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.5-3.5	.37	.37	5	6	48
į	7-14	15-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	0.5-1.0	.55	.55	İ	i	i
į	14-51	35-42	1.30-1.40	1.00-10.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	İ	i	i
į	51-60	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	į	į	į
İ		İ	İ	İ	İ	İ						
70	0 - 7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.0-3.0	.43	.43	5	6	48
ĺ	7-49	35-42	1.35-1.45	1.00-10.00	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37	ĺ	ĺ	İ
	49-63	27-32	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
	63-80	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55			
75	0 - 7	18-35	1.45-1.55	1.00-10.00	0.22-0.24	3.0-5.9	2.0-3.0	.43	.43	5	6	48
	7-49				1	1	0.5-1.0	.37	.37			
				1	1							
	63-80	24-32	1.45-1.55	1.00-10.00	0.20-0.22	3.0-5.9	0.0-0.5	.55	.55	 		
ļ										İ		
70	0 - 6				1	1	4.5-5.5	.32	.32	5	7	38
				1	1	1		1				
ļ					1					ļ		!
	42-73	26-32 	1.40-1.50 	1.00-10.00	0.18-0.20	3.0-5.9	1.0-2.0	.49	.49 		1	
25	0 - 7	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
į	7-11	30-34	1.30-1.40	1.00-10.00	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	İ	İ	İ
İ	11-20	33-38	1.30-1.40	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
ĺ	20-40	25-34	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
1	40-80	25-30	1.35-1.45	1.00-10.00	0.18-0.20	3.0-5.9	0.0-0.5	.55	.55	I	I	1
	75 100 70 75	map unit In	In	Map unit	Tin	Map unit	Map unit	May May	Mapunit	Map unit	Map unit	map unit

Physical Properties of the Soils--Continued

Map symbol	Pct. of	Depth	 Clay	 Moist	 Saturated	 Available	 Linear	 Organic	Erosi	on fact	ors		Wind erodi-
and soil name	map unit			bulk	hydraulic	water	extensi-	matter		<u> </u>		bility	bility
				density	conductivity	capacity	bility		Kw	Kf	Т	group	index
		In	Pct	g/cc	um/sec	In/in	Pct	Pct					
5030.					 		 						
Pits, limestone quarries					 		 						
5040:			 		 		 						
Udorthents, loamy	100	0-80	12-32	1.45-1.65		0.12-0.18	3.0-5.9		.32		-		
5041. Udorthents, reclaimed			 		 	 	 	 	 	 		 	
AW.			 		 		 	 		 			
Animal waste lagoon			į					į	į	i i			
SL.			 		 		 	 				 	
Sewage lagoon					İ	İ						İ	İ
W.							 -						
Water					 		 						
	l İ							I		l İ			

Chemical Properties

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

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

Cation-exchange capacity is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of exchangeable cations 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	,	Effective cation- exchange capacity		Calcium carbon- ate
	l In	 mag/100 g	meg/100 g	54	Pct
	111	meq/100 g	med/100 g	pH 	PCL
7:		j	j	j	į
Wiota, rarely flooded	0-8	17-27		5.1-7.3	0
	8-28	17-27		5.1-7.3	0
	28-59 59-80	24-28 17-27	 	5.1-6.5	0
	59-80 	17-27	 	5.0-0.5	0
7B:		i	İ	! 	
Wiota, rarely flooded	0-8	17-27		5.1-7.3	0
	8-28	17-27		5.1-7.3	0
	28-59	24-28		5.1-6.5	0
	59-80	17-27		5.6-6.5	0
8B:			 	 	
Judson	0-9	20-27		5.6-7.3	0
	9-28	23-27	i	5.6-7.3	0
	28-35	24-29		5.6-7.3	0
	35-60	17-25		6.1-7.8	0-10
15B:			 	 	
Olmitz	 0-7	20-23	 	5.6-7.3	0
01111102	7-30	19-28	 	5.1-7.3	0
	30-60	22-28		5.1-7.3	0
		ļ			[
Ely	0-8	19-29		5.6-7.3	0
	8-24	19-28		5.6-7.3	0
	24-58 58-80	22-29 15-28	 	5.6-7.3	0 0
			<u> </u>		İ
Zook	0-7	26-36		5.6-7.8	0-5
	7-20	26-36		5.6-7.8	0-5
	20-38	26-35		5.6-7.8	0-5
	38-61 61-80	28-35 14-33	 	5.6-7.3	0
16:					
Nodaway, occasionally					
flooded		15-28		6.1-7.3	0
	7-80	13-27	 	6.1-7.3	0
Kennebec,		i			
occasionally flooded	0-7	16-26		5.6-7.3	0
	7-16	16-27		5.6-7.3	0
	16-35	16-27		6.1-7.3	0
	35-48	20-27		6.1-7.3	0
	48-80	20-25	 	6.1-7.3	0
24C2:			 	 	
Shelby, moderately		j			į
eroded	0-7	20-29		5.1-7.3	0
	7-31	20-30		5.1-7.3	0
	31-48	17-27	 	7.4-8.4	5-25
	48-80 	17-27	 	0.0-8.4 	0-20
24D2:				<u> </u>	
Shelby, moderately]			[
eroded	0-7	20-29		5.1-7.3	0
	7-31	20-30		5.1-7.3	0
	31-48 48-80	17-27 17-27	 	7.4-8.4	5-25
	1 -0-00	1/-2/		0.0-0.4 	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	exchange capacity	Effective cation- exchange capacity	1	Calcium carbon- ate
	In	meq/100 g	meq/100 g	рН	Pct
24E:			 	 	
Shelby	0-7	20-29		5.1-7.3	0
	7-11	20-29		5.1-7.3	0
	11-46 46-60	20-30	 	5.1-7.3	0 5-25
	60-80	17-27		6.6-8.4	0-20
24E2:			 	 	
Shelby, moderately					
eroded	0-7	20-29	 	5.1-7.3	0
	7-31 31-48	20-30	 	5.1-7.3	0 5-25
	48-80	17-27		6.6-8.4	0-20
24F:			 		
Shelby	0-7 7-11	20-29	 	5.1-7.3	0
	11-46	20-29	 	5.1-7.3	0
	46-60	17-27		7.4-8.4	5-25
	60-80	17-27		6.6-8.4	0-20
43:					
Bremer, rarely		!		<u> </u>	ļ
flooded	0-8 8-19	23-29	 	5.6-7.3	0
	19-42	23-29	 	5.6-7.3	0
	42-50	23-30		5.6-7.3	0
	50-60	20-30		5.6-7.8	0-5
45B:			 	 	
Zook	0-7	26-36	 	5.6-7.8	0-5
	7-20 20-38	26-36	 	5.6-7.8	0-5
	38-61	28-35		5.6-7.3	0
	61-80	14-33		5.6-7.3	0
Ely	0-8	19-29	 	 5.6-7.3	0
	8-24	19-28		5.6-7.3	0
	24-58 58-80	22-29 15-28	 	5.6-7.3	0
	30-00	15-26		5.6-7.3	0
54: Zook, occasionally					İ
flooded	0-7	26-36	 	5.6-7.8	0-5
	7-20	26-36		5.6-7.8	0-5
	20-38	26-35		5.6-7.8	0-5
	38-61 61-80	28-35	 	5.6-7.3	0 0
54+:			į	į	į
Zook, occasionally			! 	! 	
flooded, overwash	0-7	17-22		5.6-7.8	0-5
	7-13	17-22		5.6-7.8	0-5
	13-50	26-35	 	5.6-7.8	0-5
	50-58 58-80	28-35	 	5.6-7.3	0
76B:			 	 	
Ladoga	0-7	16-28		5.6-7.3	0
	7-14	13-27		5.6-6.5	0
	14-51 51-60	26-31	 	5.1-6.0	0
	31.00	1,-24		3.0-0.3	

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth 	Cation- exchange capacity		Soil reaction 	Calcium carbon- ate
	l In	meg/100 g	meg/100 g	pH	Pct
76C:		İ	ĺ		İ
Ladoga	0-7	16-28		5.6-7.3	0
	7-14	13-27		5.6-6.5	0
	14-51	26-31		5.1-6.0	0
	51-60	17-24		5.6-6.5	0
76D:			 	 	
Ladoga	0-7	16-28		5.6-7.3	0
_	7-14	13-27	i	5.6-6.5	0
	14-51	26-31	i	5.1-6.0	0
	51-60	17-24		5.6-6.5	0
76D2:				 	
Ladoga, moderately eroded	 0-7	15-28	 	 5.6-7.3	0
eroded	7-49	26-31	 	5.1-6.0	0
	49-63	19-24	 	5.6-6.5	0
	63-80	17-24		5.6-6.5	0
		İ	İ	j	İ
86:					
Mt. Sterling,			!		
occasionally flooded		15-23		5.6-7.3	0
	7-26	15-24		5.6-7.3	0
	26-54 54-80	23-34	 	4.5-7.8	0-10
	54-60	23-36	 	4.5-7.6	0-10
Zook, occasionally				! 	
flooded, overwash	0-7	17-22	i	5.6-7.8	0-5
	7-13	17-22	i	5.6-7.8	0-5
	13-50	26-35		5.6-7.8	0-5
	50-58	28-35		5.6-7.3	0
	58-80	14-33		5.6-7.3	0
0.0				 	
88: Nevin, rarely flooded	 0-8	22-25	 	 5.6-7.3	0
Nevin, larely 1100ded	8-30	22-25	 	5.6-7.3	0
	30-46	24-28	 	5.6-7.3	0
	46-62	17-27		6.1-7.3	0
		İ	j	j	j
93D2:					
Shelby, moderately					
eroded	0-7	20-29		5.1-7.3	0
	7-31	20-30		5.1-7.3	0
	31-48 48-80	17-27 17-27		7.4-8.4	5-25 0-20
	40-00	17-27	 	0.0-0.4	0-20
Adair, moderately				! 	İ
eroded	0-7	20-31	i	5.1-7.3	0
	7-17	28-43	i	5.1-6.5	0
	17-60	20-28		5.1-6.5	0
	60-76	20-28		7.4-8.4	5-25
	76-80	20-28		6.1-7.8	0-20
93E2:			 	 	
Shelby, moderately eroded	 0-7	20 20	 	 5 1 7 2	
eroded	0-7 7-31	20-29	 	5.1-7.3	0
	31-48	17-27	, 	7.4-8.4	5-25
	48-80	17-27		6.6-8.4	0-20
		1	İ		

Chemical Properties of the Soils--Continued

Map symbol and soil name		exchange		reaction	Calcium carbon- ate
			capacity		İ
	In	meq/100 g	meq/100 g	pН	Pct
93E2: Adair, moderately			 		
eroded	 0-7	20-31	l l	 5.1-7.3	0
010404	7-17	28-43	 	5.1-6.5	0
	17-60	20-28		5.1-6.5	0
	60-76	20-28		7.4-8.4	5-25
	76-80	20-28		6.1-7.8	0-20
172:			 		
Wabash, frequently		i			İ
ponded, occasionally		İ	İ		İ
flooded	0-6	32-45		5.1-7.3	0
	6-19	31-45		5.1-7.0	0
	19-60	30-44		5.1-7.0	0
179E:			 		
Gara	0-7	11-29	 	5.6-7.3	0
	7-12	15-28		5.6-7.3	0
j	12-45	17-27		4.5-7.3	0
	45-80	17-27		6.6-8.4	0-20
179F:			 		
Gara	0-7	11-29		5.6-7.3	0
	7-12	15-28	i	5.6-7.3	0
į	12-45	17-28		4.5-7.3	0
	45-80	17-27		6.6-8.4	0-20
179G:			 		
Gara	0-7	11-29		5.6-7.3	0
	7-12	15-28		5.6-7.3	0
	12-45	17-28		4.5-7.3	0
	45-80	17-27		6.6-8.4	0-20
192D2:			 	 	
Adair, moderately		i			İ
eroded	0-7	20-31	i	5.1-7.3	0
į	7-17	28-43		5.1-6.5	0
	17-60	20-28		5.1-6.5	0
	60-76	20-28		7.4-8.4	5-25
	76-80	20-28		6.1-7.8	0-20
220:			 		
Nodaway, occasionally		İ	İ		İ
flooded	0-7	15-28		6.1-7.3	0
	7-80	13-27		6.1-7.3	0
222C2:			 	 	
Clarinda, moderately					
eroded	0-6	21-31	i	5.1-7.3	0
j	6-80	26-42	i	5.6-8.4	0-15
222D:			 	 	
222D: Clarinda	 0-5	21-31	 	 5.1-7.3	 0
	5-11	21-31		5.1-7.3	0
	11-19	29-40		5.1-6.5	0
	19-67	26-42		5.1-8.4	0-15
222D2:			 	 	
Clarinda, moderately			! 	 	
eroded	0-6	21-31		5.1-7.3	0
eroaea					

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Effective cation- exchange capacity		Calcium carbon- ate
	In	meq/100 g	meq/100 g	pH	Pct
00000					
222D3: Clarinda, severely		l I	 	 	
eroded	0-4	31-41	 	5.1-7.3	0
į	4-80	26-42		5.1-8.4	0-15
248:			 	 	
Wabash, occasionally					
ponded, occasionally flooded	0.7	28-32	 	 5.1-7.3	
i100ded	0-7 7-15	28-32	 	5.1-7.3	0 0
i	15-36	31-45		5.1-7.3	0
į	36-80	30-44		5.1-7.8	0-10
269:			 	 	
Humeston,	0-8	20 25	 		
occasionally flooded	0-8 8-13	20-25	 	5.6-7.3	0 0
i	13-22	17-21		5.1-7.3	0
i	22-26	23-27		5.6-7.3	0
į	26-50	27-36	i	5.6-7.3	0
	50-60	23-29		5.6-7.3	0
273B:			 	 	
Olmitz	0 - 7	20-23		5.6-7.3	0
	7-30 30-60	19-28	 	5.1-7.3	0 0
	30-60	22-28	 	5.1-7.3	0
273C:	0. 17	00.00	į		
Olmitz	0-7 7-30	19-28	 	5.6-7.3	0 0
	30-60	22-28		5.1-7.3	0
324C2:			 	 	
Dickman, moderately		i	! 	! 	
eroded	0 - 6	7.3-13	i	5.6-7.3	0
I	6-19	4.3-12		5.1-6.5	0
ļ	19-46	2.1-6.7		5.1-6.5	0
ļ	46-56 56-69	4.3-11	 	5.1-6.5	0 0
	69-80	7.4-16		6.6-8.2	0-10
324D2:			 	 	
Dickman, moderately			 	 	
eroded	0 - 6	7.3-13		5.6-7.3	0
	6-19	4.3-12		5.1-6.5	0
ļ	19-46	2.1-6.7		5.1-6.5	'
l l	46-56 56-69	4.3-11	 	5.1-6.5	0 0
	69-80	7.4-16		6.6-8.2	0-10
 354.			 	 	
Aquolls, ponded					
368:			 	 	
Macksburg	0 - 6	25-28		5.6-7.3	0
	6-24	24-27		5.6-7.3	0
	24-42	28-33		5.1-7.3	0
	42-73	21-25		5.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	exchange		Soil reaction	Calcium
		capacity	exchange capacity	 	ate
	In	meq/100 g	meq/100 g	рН	Pct
369:			 	 	l I
Winterset	0-7	23-28	i	5.6-7.3	0
	7-19	26-29		5.6-7.3	0
	19-58	27-33		5.1-7.3	0
	58-69	18-27	 	5.6-7.3	0
370:				 	
Sharpsburg	0 - 8	22-27		5.1-6.5	0
	8-17	24-27		5.1-6.5	0
	17-38	28-32		5.1-6.5	0
	38-60	18-26	 	6.1-7.3	0
370B:					İ
Sharpsburg	0 - 8	22-27		5.1-6.5	0
	8-17	24-27		5.1-6.5	0
	17-38	28-32		5.1-6.5	0
	38-60	18-26	 	6.1-7.3 	0
371C2:		į	į	İ	į
Sharpsburg,					
moderately eroded		22-27		5.1-6.5	0
	7-31 31-70	24-31 18-29	 	5.1-6.5	0
	70-80	18-26		6.1-7.3	0
		İ	İ	İ	İ
Nira, moderately eroded	0-7	25-28	 	 5.6-7.3	0
eroded	7-12	22-29	 	5.6-7.3	0
	12-45	20-26		5.6-7.3	0
	45-80	17-23		6.1-7.3	0
371D2:			 	 	
Sharpsburg,		i	i	 	<u> </u>
moderately eroded	0-7	22-27	i	5.1-6.5	0
-	7-31	24-31	i	5.1-6.5	0
	31-70	18-29		5.6-6.5	0
	70-80	18-26		6.1-7.3	0
Nira, moderately			 	 	
eroded	0-7	25-28		5.6-7.3	0
	7-12	22-29		5.6-7.3	0
	12-45	20-26		5.6-7.3	0
	45-80	17-23	 	6.1-7.3	0
421C2:				! 	
Gara, moderately					
eroded		11-29		5.6-7.3	0
	5-43	20-28		4.5-7.3	0
	43-62 62-80	20-27	 	7.4-8.4	5-25
			į		į
Bucknell, moderately eroded	0.7	21 22			
eroded	0-7 7-34	21-28	 20-33	4.5-7.0	0
	34-71	19-29	20-33	5.1-6.0	0
	71-80	20-29		5.6-7.8	0-15
			İ		į

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	exchange	Soil reaction 	Calcium carbon- ate
	In	 meg/100 g	meg/100 g	рн	Pct
	111	meq/100 g	meq/100 g	PH	FCC
421D2:		İ	İ	İ	j
Gara, moderately					
eroded	0 - 5	11-29		5.6-7.3	0
ļ	5-43	20-28		4.5-7.3	0
	43-62 62-80	20-27	 	7.4-8.4	5-25
ļ	02-00	17-27	 	0.0-0.1	0-20
Bucknell, moderately		İ		! 	İ
eroded	0 - 7	21-28		4.5-7.0	0
I	7-34		20-33	4.5-6.0	0
	34-71	19-29		5.1-6.0	0
	71-80	20-29		5.6-7.8	0-15
101-0					
421E2: Gara, moderately			 	 	
eroded	0-5	11-29	l 	 5.6-7.3	0
	5-43	20-28	 	4.5-7.3	0
i	43-62	20-27		7.4-8.4	5-25
į	62-80	17-27		6.6-8.4	0-20
į		j	İ	İ	j
Bucknell, moderately					
eroded	0 - 7	21-28		4.5-7.0	0
	7-34		20-33	4.5-6.0	0
	34-71	19-29		5.1-6.0	0
ļ	71-80	20-29		5.6-7.8	0-15
435:			l I		
Zook, occasionally			 	 	
flooded	0-7	26-36	 	5.6-7.8	0-5
	7-20	26-36		5.6-7.8	0-5
i	20-38	26-35		5.6-7.8	0-5
į	38-61	28-35		5.6-7.3	0
j	61-80	14-33		5.6-7.3	0
I					
Mt. Sterling,					
occasionally flooded		15-23		5.6-7.3	0
ļ	7-26 26-54	15-24		5.6-7.3	0
l l	26-54 54-80	23-34	 	4.5-7.8	0-10
ļ	34-00	23-36	 	1 .5-7.0	0-10
469C2:		İ		! 	İ
Lamoni, moderately		İ			İ
eroded	0-6	22-31		5.1-7.3	0
į	6-23	23-40		5.1-7.3	0
I	23-55	20-28		6.1-7.3	0
ļ	55-80	20-28		6.6-8.4	0-20
Clarinda, moderately eroded	0.6	21 21	 	 5.1-7.3	
erogeg	0-6 6-80	21-31	 	5.6-8.4	0 0-15
!	0-00	20-12	 	3.0-0.4	0-13
			! 	! 	
Shelby, moderately					
Shelby, moderately eroded	0-7	20-29		5.1-7.3	0
	0-7 7-31	20-29		5.1-7.3	0
		1	 	1	:

Chemical Properties of the Soils--Continued

Map symbol	Depth		Effective		Calcium
and soil name			cation-	reaction	carbon-
		capacity			ate
	In		meq/100 g	 рН	 Pct
			į	į -	į
469C3: Lamoni, severely			 	 	
eroded	0-7	22-31		5.1-7.3	0
i	7-14	22-40	i	5.1-7.3	0
I	14-48	20-28		6.1-7.3	0
	48-60	20-28		6.6-8.4	0-20
Clarinda, severely				 	
eroded	0 - 4	31-41		5.1-7.3	0
	4-80	26-42		5.1-8.4	0-15
Shelby, severely				 	
eroded	0-2	20-28		5.1-7.3	0
I	2-48	20-30		5.1-7.3	0
	48-62	17-27		6.6-8.4	0-20
	62-80	17-27	 	6.6-8.4	0-20
470D2:		İ	İ		İ
Lamoni, moderately					
eroded		22-31		5.1-7.3	0
	6-23 23-55	23-40	 	5.1-7.3	0 0
	55-80	20-28	 	6.6-8.4	0-20
Chalba madamatala					
Shelby, moderately eroded	0-7	20-29	 	 5.1-7.3	 0
	7-31	20-30	 	5.1-7.3	0
	31-48	17-27		7.4-8.4	5-25
	48-80	17-27		6.6-8.4	0-20
545B:			 	 	
Zook	0-7	26-36	i	5.6-7.8	0-5
İ	7-20	26-36		5.6-7.8	0-5
I	20-38	26-35		5.6-7.8	0-5
	38-61	28-35		5.6-7.3	0
	61-80	14-33	 	5.6-7.3	0
Ely	0-8	19-29		5.6-7.3	0
	8-24	19-28		5.6-7.3	0
	24-58	22-29		5.6-7.3	0
	58-80	15-28	 	5.6-7.3 	0
Gullied land.		į	į	İ	į
569C:			 	 	
Nira	0-7	25-28	i	5.6-7.3	0
i	7-11	25-28	i	5.6-7.3	0
į	11-20	22-29	i	5.6-7.3	0
	20-40	20-26		5.6-7.3	
	40-80	17-23		6.1-7.3	0
Clearfield	0 - 7	26-30	 	 5.6-7.3	0
İ	7-17	25-30		5.6-7.3	0
	17-54	22-31		5.6-7.3	
	54-71	24-45		5.1-6.5	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	exchange	Effective cation-	reaction	Calcium carbon-
	 	capacity	exchange capacity	 	ate
	In	meq/100 g	meq/100 g	pH	Pct
579E3: Bucknell, severely	 		 	 	
eroded	0-3	20-28		4.5-7.0	0
	3-12	19-29	i	5.1-6.0	0
	12-20	26-36		5.1-6.0	0
	20-68 68-80	19-29 20-29	 	5.1-6.0 5.6-7.8	0 0-15
Hedrick, severely			 	 	
eroded	0-2	17-25	j	5.6-7.3	0
	2-22	22-29		5.1-6.5	0
	22-53	20-27		5.1-6.5	0
	53-74 74-80	17-26 20-28	 	6.1-8.4 5.1-6.5	0-5 0
794C2:			 	 	
Armstrong, moderately		İ	İ		İ
eroded	0-5	22-28		5.6-7.3	0
	5-11	23-31		5.6-7.3	0
	11-18 18-50	24-43	 	4.5-6.5	0 0
	50-80	19-26		5.6-7.8	0-15
Ladoga, moderately	 		 	 	
eroded	0-7	16-28		5.6-7.3	0
	7-49	26-31	i	5.1-6.0	0
	49-63	19-24		5.6-6.5	0
	63-80	17-24		5.6-6.5 	0
822D2: Lamoni, moderately					
eroded	 0-6	22-31	 	 5.1-7.3	0
020404	6-23	23-40		5.1-7.3	0
	23-55	20-28	j	6.1-7.3	0
	55-80	20-28		6.6-8.4	0-20
870B:					
Sharpsburg, terrace	0-8	22-27		5.1-6.5	0
	8-17 17-38	24-27	 	5.1-6.5	0 0
	38-60	18-26		6.1-7.3	0
870C2:			 		
Sharpsburg, terrace,	İ	İ	İ	ĺ	į
moderately eroded		22-27		5.1-6.5	0
	7-31	24-31		5.1-6.5	0
	31-70 70-80	18-29 18-26		5.6-6.5 6.1-7.3	0 0
870D2:			 	 	
Sharpsburg, terrace,	j	İ	İ		İ
moderately eroded		22-27		5.1-6.5	0
	7-31	24-31		5.1-6.5	0
	31-70 70-80	18-29	 	5.6-6.5	0 0
876B:			 	 	
Ladoga, terrace	0-7	16-28		5.6-7.3	0
	7-14	13-27		5.6-6.5	0
	14-51	26-31	 	5.1-6.0	0
	51-60 	1/-24		3.0-0.5	0

Chemical Properties of the Soils--Continued

	Depth	Catlon-	Effective	Soil	Calcium
and soil name	1	exchange	cation-	reaction	carbon-
		capacity	exchange		ate
			capacity		
	In	meq/100 g	meq/100 g	pН	Pct
876C2:					
Ladoga, terrace,					
moderately eroded	0-7	16-28		5.6-7.3	0
	7-49	26-31		5.1-6.0	0
	49-63	19-24		5.6-6.5	0
	63-80	17-24	 	5.6-6.5	0
876D2:			! 		
Ladoga, terrace,		İ	ĺ		İ
moderately eroded	0-7	16-28		5.6-7.3	0
	7-49	26-31		5.1-6.0	0
]	49-63	19-24		5.6-6.5	0
	63-80	17-24		5.6-6.5	0
2368B:			 		1
Macksburg	0-6	25-28	i	5.6-7.3	0
	6-24	24-28	i	5.6-7.3	0
į	24-42	28-32		5.1-7.3	0
	42-73	21-25		5.6-7.3	0
Nira	 0-7	25-28	 	 5.6-7.3	0
i	7-11	25-28	i	5.6-7.3	0
į	11-20	22-29		5.6-7.3	0
ļ	20-40	20-26		5.6-7.3	0
	40-80	17-23		6.1-7.3	0
5030.			 		
Pits, limestone		İ	ĺ		İ
quarries					ļ
5040.			 		1
Udorthents, loamy		į			į
5041.			 		
Udorthents, reclaimed					į
AW.			 		I I
Animal waste lagoon	İ	i	İ		İ
SL.			 -		
Sewage lagoon			 		
W					
w. Water			I I		

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)

				Water	table		Ponding		Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	Surface water depth	Duration	Frequency 	Duration	Frequenc
	Ī		Ī	Ft	Ft	Ft				
: Tiota, rarely flooded		T	 					 		
viota, rarely flooded	B	Low	January	6.0-6.7	. 6 0			None		None
			February	5.5-6.7				None	Brief	Rare
			March	4.5-6.5				None	Brief	Rare
			April	4.0-6.0				None	Brief	Rare
			May	4.5-6.5				None	Brief	Rare
			may June			1 1		None	Brief	Rare
			1	5.0-6.7				None	Brief Brief	Rare
			July	6.0-6.7				1		
			August	6.5-6.7				None	Brief	Rare
	!!!		September					None	Brief	Rare
	!!!		October	6.5-6.7				None	Brief	Rare
	!!!		November	5.5-6.7				None	Brief	Rare
			December	6.0-6.7	>6.0			None		None
3:	į į									
Niota, rarely flooded	В	Low				!!!				!
			January	6.0-6.7				None		None
			February	5.5-6.7				None	Brief	Rare
			March	4.5-6.5				None	Brief	Rare
			April	4.0-6.0				None	Brief	Rare
			May	4.5-6.5				None	Brief	Rare
			June	5.0-6.7				None	Brief	Rare
			July	6.0-6.7	>6.0			None	Brief	Rare
			August	6.5-6.7	>6.0			None	Brief	Rare
			September	6.5-6.7	>6.0			None	Brief	Rare
			October	6.5-6.7	>6.0			None	Brief	Rare
			November	5.5-6.7	>6.0			None	Brief	Rare
	1 i		December	6.0-6.7	>6.0	i i		None		None

Hydro- logic group 	Surface runoff	Month 	Upper limit	Lower	 Surface water	Duration	Frequency	Duration	Frequency
 B	Low		Ft		depth		<u>i i</u>		<u> </u>
 B	Low			Ft	Ft				ļ
B 	Low								
 B	LOW	1	! !		!!!				
			 				None		None
I		January					None		None
1		February March					None		None
!		1	: :		!		!		1
!			!!!		!				None
!			! !		!				None
- !		1	! !		!		!		None
!			: :		1		!		None
!			: :		1				None
!					1				None
ļ		1	! !		!				None
									None
ļ		December					None		None
В	Low								
		January					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
- 1		August	6.5-6.7	>6.0			None		None
- 1		September	6.5-6.7	>6.0			None		None
- 1		October	6.5-6.7	>6.0			None		None
- 1		November	5.5-6.7	>6.0			None		None
- 1		December	6.0-6.7	>6.0			None		None
- 1									
В	Very high								
- 1		January	3.0-5.5	>6.0			None		None
- 1		February	2.5-5.0	>6.0			None		None
1		March	1.5-4.0	>6.0			None		None
į		April	1.0-3.5	>6.0	i i		None		None
į		May	1.5-4.0	>6.0	i i		None		None
į		June	2.0-4.5	>6.0	i i		None		None
i		July			i i		None		None
i		August	3.5-6.0	>6.0	i i		None		None
i		, ,			i i		None		None
i		October			i i		None		None
i		November			i i		None		None
i			1		i i				None
	B		January February March April May June July August September October November December B Very high January February March April May June July August September October October October October October October October October October October October	May	May	May	May	May	May

		 		Water	table		Ponding		Floc	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower	 Surface water depth	Duration	Frequency	Duration	Frequenc
				Ft	Ft	Ft				
5B:		 								
Zook	- C/D	 Very high	i			i i		i i		i
	-/-		January	2.0-3.5	>6.0	i i		None		None
	i		February	1.5-3.0		i i		None		None
	i		March	0.5-2.0	>6.0	i i		None		None
	į i		April	0.0-1.0	>6.0	i i		None		None
	į i		May	0.5-1.5	>6.0	i i		None		None
	į i	ĺ	June	1.0-2.0	>6.0	i i		None		None
			July	2.0-3.0	>6.0	j j		None		None
			August	2.5-3.5	>6.0	i i		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
6:										
Nodaway, occasionally						1				
flooded	- B	Low								
			January	6.0-6.7				None		None
			February	5.5-6.7				None	Brief	Occasio
			March	4.5-6.5				None	Brief	Occasio
			April	4.0-6.0				None	Brief	Occasio
			May	4.5-6.5				None	Brief	Occasio
			June	5.0-6.7				None	Brief	Occasio
			July	6.0-6.7				None	Brief	Occasio
			August	6.5-6.7				None	Brief	Occasio
			September					None	Brief	Occasio
			October	6.5-6.7				None	Brief	Occasio
			November December	5.5-6.7				None None	Brief 	Occasio
Kennebec, occasionally	İ		İ			į į		j j		İ
flooded	- в	Low	i	i		i i		i i		i
	-	==::	January	6.0-6.7	>6.0	i i		None		None
			February	5.5-6.7		i i		None	Brief	Occasio
			March	4.5-6.5		i i		None	Brief	Occasio
			April	4.0-6.0		i i		None	Brief	Occasio
			May	4.5-6.5		i i		None	Brief	Occasio
	i		June	5.0-6.7		i i		None	Brief	Occasio
	j		July	6.0-6.7		i i		None	Brief	Occasio
	i		August	6.5-6.7		i i		None	Brief	Occasio
	i		September			i i		None	Brief	Occasio
	į		October	6.5-6.7		i i		None	Brief	Occasio
	i		November	5.5-6.7		i i		None	Brief	Occasio

				Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit 	Surface water depth	Duration	Frequency	Duration	Frequency
	i i		i	Ft	Ft	Ft		i i		İ
	i i		i	İ	İ	i i		i i		i
24C2:	i i		i	į	į	i i		i i		İ
Shelby, moderately eroded	C	Medium	İ	İ	İ	į į		į į		İ
	į į		January			i i		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
24D2:										
Shelby, moderately eroded	C	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
24E:				į		į į		į į		į
Shelby	C	Medium				<u> </u>				
	!!!		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
	1 1		1	T.	I	1 1		1		T. Control of the Con

				Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
24E2:			I I	 						1
Shelby, moderately eroded	c	Medium	İ			1 1				İ
,	i - i		January	i i		i i		None		None
	i i		February	i i		i i		None		None
	i i		March	i i		i i		None		None
	i i		April	i i		i i		None		None
	i i		May	i i		i i		None		None
	i i		June	i i		i i		None		None
	i i		July	i i		i i		None		None
	i i		August	i i		i i		None		None
	i i		September	i i		i i		None		None
	i i		October	i i		i i		None		None
	i i		November	i i		i i		None		None
	į į		December	i i		j j		None		None
24F:				 						
Shelby	c	High	i	i i		i i		i i		i
Shelly		9	January			i i		None		None
	i		February	i i		i i		None		None
			March			i i		None		None
			April			i i		None		None
			May					None		None
	i i		June	i i		i i		None		None
			July					None		None
			August					None		None
	i		September	i i		i i		None		None
			October					None		None
			November			i i		None		None
	i i		December					None		None
13:				 						
Bremer, rarely flooded	c	Very high		i i		i i				İ
			January	2.0-3.5				None		None
			February	1.5-3.0				None	Brief	Rare
			March	0.5-2.0	>6.0			None	Brief	Rare
			April	0.0-1.0				None	Brief	Rare
			May	0.5-1.5				None	Brief	Rare
			June	1.0-2.0				None	Brief	Rare
			July	2.0-3.0				None	Brief	Rare
			August	2.5-3.5	>6.0			None	Brief	Rare
			September					None	Brief	Rare
			October	2.5-3.5	>6.0			None	Brief	Rare
			November	1.5-3.0	>6.0			None	Brief	Rare

	 	 	l I	Water	table		Ponding		Floc	ding
	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower	Surface water depth	Duration	Frequency 	Duration	Frequency
ļ				Ft	Ft	Ft				
45B:	 	 								
Zook	C/D	Very high	i	i i		i i		i i		i
	-/-		January	2.0-3.5	>6.0	i i		None		None
		 	February	1.5-3.0		i i		None		None
		 	March	0.5-2.0		i i		None		None
		 	April	0.0-1.0		i i		None		None
		 	May	0.5-1.5		i i		None		None
	 		June	1.0-2.0		i i		None		None
	 		July	2.0-3.0		i i		None		None
	 		August	2.5-3.5		i i		None		None
	 		September			i i		None		None
	 		October	2.5-3.5		i i		None		None
	 		November	1.5-3.0		i i		None		None
			December	2.0-3.5		i i		None		None
	j		i	i i		i i		i i		İ
Ely	В	Very high	İ	į į		į į		į į		İ
į			January	3.0-5.5	>6.0	i i		None		None
į			February	2.5-5.0	>6.0	i i		None		None
į			March	1.5-4.0	>6.0	i i		None		None
į			April	1.0-3.5	>6.0	i i		None		None
į			May	1.5-4.0	>6.0	i i		None		None
į			June	2.0-4.5	>6.0	i i		None		None
·	İ	ĺ	July	3.0-5.5	>6.0	i i		None		None
·	İ	ĺ	August	3.5-6.0	>6.0	i i		None		None
·	İ	ĺ	September	4.0-6.5	>6.0	i i		None		None
;	i		October	3.5-6.0	>6.0	i i		None		None
;	i		November	2.5-5.0	>6.0	i i		None		None
ļ			December	3.0-5.5	>6.0	j j		None		None
54:	 									
Zook, occasionally flooded	c/p	 Very high		i i						İ
	0,2	'01' 111911	January	2.0-3.5	>6.0	i i		None		None
	 		February	1.5-3.0		i i		None	Brief	Occasion
	 		March	0.5-2.0		i i		None	Brief	Occasion
	 		April	0.0-1.0		i i		None	Brief	Occasion
	 		May	0.5-1.5		i i		None	Brief	Occasion
	 		June	1.0-2.0		i i		None	Brief	Occasion
		 	July	2.0-3.0		i i		None	Brief	Occasion
		 	August	2.5-3.5				None	Brief	Occasion
		! 	September					None	Brief	Occasion
	 	 	October	2.5-3.5				None	Brief	Occasion
	 	 	November	1.5-3.0				None	Brief	Occasion
		!	December	2.0-3.5				None	Prier	None

				Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	 Month 	Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				[
54+:										
Zook, occasionally					 	1 1				I I
flooded, overwash	C/D	Very high			l I					1
1100ded, Overwash	6/5	very migh	January	2.0-3.5	 			None		None
			February	1.5-3.0				None	Brief	Occasional
			March	0.5-2.0				None	Brief	Occasional
			April	0.0-1.0				None	Brief	Occasional
			May	0.5-1.5				None	Brief	Occasional
			June	1.0-2.0				None	Brief	Occasional
			July	2.0-3.0				None	Brief	Occasional
			August	2.5-3.5				None	Brief	Occasional
			September	3.0-4.0				None	Brief	Occasional
			October	2.5-3.5				None	Brief	Occasional
			November	1.5-3.0		i i		None	Brief	Occasional
	i i		December	2.0-3.5				None		None
	į į		İ	İ	ĺ	į į		i i		İ
76B:			ļ					! !		!
Ladoga	B	Low								
			January	6.0-6.7				None		None
			February	5.5-6.7				None		None
			March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None
			July	6.0-6.7				None		None
			August	6.5-6.7				None		None
			September	6.5-6.7				None		None
			October	6.5-6.7				None		None
	!!!		November	5.5-6.7				None		None
			December	6.0-6.7	>6.0			None		None
R.C.								! !		
76C:		Mr. 41								
Ladoga	B	Medium	 					N		
			January	6.0-6.7				None		None
			February	5.5-6.7				None		None
			March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None None
			July	6.0-6.7				None		
			August	6.5-6.7				None		None
			September	6.5-6.7		! !		None		None
			October	6.5-6.7				None None		None None
	1		November	5.5-6.7						None
			December	6.0-6.7	L C O			None		None

		 		Water	table		Ponding	·	Floo	ding
Map symbol	 Hydro-	Surface	Month	Upper	Lower	Surface	Duration	Frequency	Duration	Frequency
and soil name	logic	runoff	İ	limit	limit	water		į į į		İ
	group	İ	İ	İ	İ	depth		į į		İ
				Ft	Ft	Ft				Ī
			ļ					! !		
76D:			!	!				!!!		
Ladoga	В	Medium	ļ							
			January	6.0-6.7				None		None
			February	5.5-6.7				None		None
			March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None
			July	6.0-6.7				None		None
			August	6.5-6.7				None		None
			September					None		None
			October	6.5-6.7				None		None
			November	5.5-6.7	>6.0			None		None
			December	6.0-6.7	>6.0			None		None
76D2:	 	 	I I	l I	 	 				
Ladoga, moderately eroded	В	Medium	j	İ		i i		i i		
			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
	İ		August	6.5-6.7	>6.0			None		None
	İ		September	6.5-6.7	>6.0			None		None
	İ		October	6.5-6.7	>6.0			None		None
	į i	İ	November	5.5-6.7	>6.0	i i		None		None
	į į		December	6.0-6.7	>6.0	ļ ļ		None		None
86:	 	 		1	 	 				
Mt. Sterling, occasionally	i		i	i	i	i i		i i		İ
flooded		 Very high	i	İ	 	i i		i		İ
1100404		very migh	January	2.0-3.5	 >6 0			None		None
		 	February	1.5-3.0				None	Brief	Occasiona
		 	March	0.5-2.0				None	Brief	Occasiona
		 	April	0.0-1.0				None	Brief	Occasiona
		 	May	0.5-1.5				None	Brief	Occasiona
		 	June	1.0-2.0				None	Brief	Occasiona
		I I	July	2.0-3.0		 		None	Brief	Occasiona
		 	August	2.5-3.5				None	Brief	Occasiona
	1	 	, ,					None	Brief Brief	Occasiona
		 	September			!!!		1 1		Occasiona
		 	October	2.5-3.5				None	Brief	
			November	1.5-3.0		1 1		None	Brief	Occasiona
	1	I	December	2.0-3.5	>6.0			None		None

				Water	table		Ponding	r	Floo	oding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month 	Upper limit	Lower	Surface water depth	Duration	Frequency 	Duration	Frequency
	[[ļ	Ft	Ft	Ft]		
0.5										
86:			l I							
Zook, occasionally flooded, overwash	C/D	Very high	I							
1100ded, Overwash	C/D	very nigh	January	2.0-3.5	>6 N			None		None
			February	1.5-3.0				None	Brief	Occasiona
	1 1		March	0.5-2.0				None	Brief	Occasional
	1 1		April	0.0-1.0				None	Brief	Occasional
	1 1		May	0.5-1.5				None	Brief	Occasional
	i i		June	1.0-2.0				None	Brief	Occasional
	i i		July	2.0-3.0		i i		None	Brief	Occasional
	i i		August	2.5-3.5				None	Brief	Occasional
	i i		September	3.0-4.0		i i		None	Brief	Occasiona
	i i		October	2.5-3.5				None	Brief	Occasional
	ii		November	1.5-3.0		i i		None	Brief	Occasional
	i i		December	2.0-3.5		i i		None		None
88: Nevin, rarely flooded	 B	Very high								
,	i - i		January	3.0-5.5	>6.0	i i		None		None
	i i		February	2.5-5.0		i i		None	Brief	Rare
	i i		March	1.5-4.0		i i		None	Brief	Rare
	i i		April	1.0-3.5		i i		None	Brief	Rare
	i i		May	1.5-4.0		i i		None	Brief	Rare
	i i		June	2.0-4.5		i i		None	Brief	Rare
	i i		July	3.0-5.5		i i		None	Brief	Rare
	i i		August	3.5-6.0	>6.0	i i		None	Brief	Rare
	i i		September	4.0-6.5		i i		None	Brief	Rare
	i i		October	3.5-6.0		i i		None	Brief	Rare
	i i		November	2.5-5.0		i i		None	Brief	Rare
	į į		December	3.0-5.5	>6.0	į į		None		None
93D2:										
Shelby, moderately eroded	c	Medium	i	i i		i i		i i		İ
			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
	1 1		December					None		None

		 		Water	table		Ponding	ļ	Floo	ding
Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Upper limit	Lower	Surface water depth	Duration	Frequency	Duration	Frequenc
				Ft	Ft	Ft		! !		
93D2:		 		1	 	 				
Adair, moderately eroded	c	 Very high	i	i	İ	i i		i i		i
	i		January			i i		None		None
	i		February			i i		None		None
	İ		March	1.5-2.0	2.5-2.5	i i		None		None
	İ		April	1.0-1.3	1	i i		None		None
	i		May	1.3-1.5	1	i i		None		None
	i		June	1.5-2.0	1	i i		None		None
	i		July			i i		None		None
	i	i I	August			i i		None		None
	i	! [September					None		None
	i	! [October	1.0-1.5	1	i i		None		None
	i	! 	November	1.5-2.0	1			None		None
	1	! [December	1.5-2.0		1 1		None		None
	1	! [December	1.5 2.0	2.3 2.3	i i		10110		110110
3E2:	 	 	1		 	 				1
Shelby, moderately eroded	C	 Medium			 	; ;				1
shelby, moderatery eroded	-	Medium	January		 	 		None		None
		 	February		 	 		None		None
		l I	March		 	 		None		None
		 	1		 	 		None		None
		 	April		 	 		None		None
		 	May	!	 	 				
			June		 	 		None		None
			July	1	1	1 1		None		None
			August					None		None
			September					None		None
			October					None		None
			November					None		None
			December					None		None
						!!!				!
Adair, moderately eroded	C	Very high				!!!				
			January					None		None
	ļ		February					None		None
	!		March	1.5-2.0	1			None		None
			April	1.0-1.3	1			None		None
			May	1.3-1.5	,			None		None
			June	1.5-2.0	!			None		None
			July					None		None
			August					None		None
			September					None		None
			October	1	2.5-2.5			None		None
			November	1.5-2.0	1			None		None
	1	I	December	1.5-2.0	12 5 2 5	l I		None		None

		 		Water	table		Ponding	ı	Floo	oding
Map symbol and soil name	Hydro- logic group	Surface runoff	Month 	Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
150										
172:		 								
Wabash, frequently ponded, occasionally flooded		 Negligible	I I							
occasionally flooded	ן ע	Negrigible	January	2.0-3.5	 >6.0			None		None
		 	February	1.5-3.0		0.0-1.0	Long	Frequent	Long	Occasiona
			March	0.5-2.0		0.0-1.0	Long	Frequent	Long	Occasional
			April	0.0-1.0		0.0-1.0	Long	Frequent	Long	Occasional
			May	0.5-1.5		0.0-1.0	Long	Frequent	Long	Occasional
			June	1.0-2.0		0.0-1.0	Long	Frequent	Long	Occasional
		 	July	2.0-3.0		0.0-1.0	Long	Frequent	Long	Occasional
		 	August	2.5-3.5		0.0-1.0	Long	Frequent	Long	Occasional
		 	September	3.0-4.0		0.0-1.0	Long	Frequent	Long	Occasiona
		 	October	2.5-3.5		0.0-1.0	Long	Frequent	Long	Occasional
			November	1.5-3.0		0.0-1.0	Long	Frequent	Long	Occasional
	į		December	2.0-3.5				None		None
179E:						 				
Gara	C	Medium	İ	İ	İ	i i		į i		i
	i i		January	i		i i		None		None
	i i		February	i		i i		None		None
	į į		March			i i		None		None
	į i	ĺ	April			i i		None		None
	į i	ĺ	May			i i		None		None
	į i	ĺ	June			j j		None		None
	į i		July			i i		None		None
	į į		August			j j		None		None
			September					None		None
			October					None		None
			November					None		None
			December					None		None
179F:										
Gara	C	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
			1	1		1				

		 		Water	table	[Ponding	r	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	 Month 	Upper limit	Lower	 Surface water depth	Duration	Frequency	Duration	Frequency
			İ	Ft	Ft	Ft				Ī
	ĺ		İ	ĺ	ĺ	į į		į į		İ
179G:	!									!
Gara	C	High								
	!		January					None		None
			February					None		None
			March					None		None
			April					None		None
			May		 			None		None
		 	June		I	1 1		None		None
		 	July		 	 		None		None
		 	August	1	 	1 1		None		None
		 	September		 	 		None		None
		 	October	!	 	!!!		None		None
		 	November		 			None		None
	 	 	December		 			None		None
192D2:	 	 			 	 				
Adair, moderately eroded	C	 Very high			 					i
		'01' 111911	January			i i		None		None
	<u> </u>		February		 			None		None
	i		March		2.5-2.5	i i		None		None
	i		April		2.5-2.5	i i		None		None
	i		May	1.3-1.5	,			None		None
		 	June	1.5-2.0	1	i i		None		None
	i	 	July			i i		None		None
	i	 	August			i i		None		None
	i	 	September			i i		None		None
	i	 	October	1	2.5-2.5	i i		None		None
		 	November		2.5-2.5			None		None
			December	1.5-2.0		i i		None		None
220:										
Nodaway, occasionally										
flooded	В	Low								
			January	6.0-6.7	,			None		None
			February	5.5-6.7				None	Brief	Occasion
			March	4.5-6.5				None	Brief	Occasion
			April	4.0-6.0				None	Brief	Occasion
			May	4.5-6.5				None	Brief	Occasion
			June	5.0-6.7				None	Brief	Occasion
			July	6.0-6.7				None	Brief	Occasion
			August	6.5-6.7	1			None	Brief	Occasion
			September					None	Brief	Occasion
			October	6.5-6.7	1			None	Brief	Occasion
			November	5.5-6.7	1			None	Brief	Occasion
	1		December	6.0-6.7	>6.0			None		None

				Water	table		Ponding		Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit 	 Surface water depth	Duration	Frequency 	Duration	Frequenc
	1		Ī	Ft	Ft	Ft				
222C2: Clarinda, moderately	i 	 	 	 	 	j j 		 		i
eroded	D	Very high								
			January					None		None
			February	1.5-2.0	1			None		None
			March	0.0-1.0	2.0-2.0			None		None
			April	0.0-1.0	2.0-2.0			None		None
			May	0.5-1.5	2.0-2.0			None		None
			June	1.0-1.5	2.0-2.0			None		None
			July	1.5-2.0	2.0-2.0			None		None
			August					None		None
			September					None		None
	ĺ		October	1.0-1.5	2.0-2.0	i i		None		None
	ĺ		November	1.5-2.0	2.0-2.0	i i		None		None
	İ	 	December	1.5-2.0	2.0-2.0			None		None
222D:										
Clarinda	D	Very high	ļ		!					
	!		January					None		None
	!		February	1.5-2.0	1			None		None
			March	0.0-1.0	1			None		None
			April	0.0-1.0	1			None		None
			May	0.5-1.5	1			None		None
			June	1.0-1.5	1			None		None
			July	1.5-2.0				None		None
			August	1				None		None
			September		1			None		None
			October	1.0-1.5	1			None		None
			November	1.5-2.0				None		None
			December	1.5-2.0	2.0-2.0			None		None

				Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	 Month 	Upper limit	Lower limit 	 Surface water depth	Duration	Frequency 	Duration	Frequenc
			Ţ	Ft	Ft	Ft				
222D2:					 	 				
Clarinda, moderately			i		 	 				i
eroded	D	 Very high	i					i		1
323434	-	'01' 111911	January			' 		None		None
			February	1.5-2.0	1	' 		None		None
			March	0.0-1.0				None		None
			April	0.0-1.0				None		None
			May	0.5-1.5				None		None
			June	1.0-1.5				None		None
			July	1.5-2.0				None		None
			August					None		None
			September		1	' 		None		None
		 	October	1	2.0-2.0	1 1		None		None
		 	November	1.5-2.0				None		None
			December	1.5-2.0	1			None		None
222D3:					 	 				
Clarinda, severely eroded	D	Very high	j	į	į	į į		į į		İ
			January					None		None
			February	1.5-2.0	2.0-2.0			None		None
			March	0.0-1.0	2.0-2.0			None		None
			April	0.0-1.0	2.0-2.0			None		None
			May	0.5-1.5	2.0-2.0			None		None
	İ		June	1.0-1.5	2.0-2.0	i i		None		None
	İ		July	1.5-2.0	2.0-2.0	i i		None		None
	l i		August			i i		None		None
	l i		September			i i		None		None
	l i		October	1.0-1.5	2.0-2.0	i i		None		None
	į į		November	1.5-2.0	2.0-2.0	i i		None		None
	İ		December	1.5-2.0	2.0-2.0	i i		None		None

				Water	table		Ponding	·	Floo	ding
Map symbol	 Hydro-	Surface	Month	Upper	Lower	Surface	Duration	Frequency	Duration	Frequency
and soil name	logic	runoff	İ	limit	limit	water		į į		ĺ
	group		İ	į į		depth		į į		
				Ft	Ft	Ft				
48:										
Wabash, occasionally	İ	İ	İ	į į		į į		i i		İ
ponded, occasionally										
flooded	D	Negligible								
			January	2.0-3.5	>6.0			None		None
			February	1.5-3.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			March	0.5-2.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			April	0.0-1.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			May	0.5-1.5	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			June	1.0-2.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			July	2.0-3.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			August	2.5-3.5	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
			September	3.0-4.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
	ĺ		October	2.5-3.5	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
	İ		November	1.5-3.0	>6.0	0.0-1.0	Long	Occasional	Long	Occasion
	į		December	2.0-3.5	>6.0	ļ ļ		None		None
69:										
Humeston, occasionally										
flooded	C/D	Very high								
			January	2.0-3.5	>6.0			None		None
	ĺ		February	1.5-3.0	>6.0	i i		None	Brief	Occasion
	İ		March	0.5-2.0	>6.0	i i		None	Brief	Occasion
	İ	ĺ	April	0.0-1.0	>6.0	i i		None	Brief	Occasion
	İ		May	0.5-1.5	>6.0	i i		None	Brief	Occasion
	i		June	1.0-2.0	>6.0	i i		None	Brief	Occasion
	İ		July	2.0-3.0	>6.0	i i		None	Brief	Occasion
	İ		August	2.5-3.5	>6.0	i i		None	Brief	Occasion
	İ		September			i i		None	Brief	Occasion
	İ		October	2.5-3.5		i i		None	Brief	Occasion
	i		November	1.5-3.0		i i		None	Brief	Occasion
	1	1			>6.0	1 1				,

				Water	table		Ponding		Floo	ding
	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	Surface water depth	Duration	Frequency 	Duration	Frequency
	İ		i	Ft	Ft	Ft		i i		İ
	i i		i	i		i i		i i		İ
273B:	į į		j	į i		i i		į į		İ
Olmitz	B	Low	ĺ	İ		į į		į į		
			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				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				None		None
			November	5.5-6.7				None		None
			December	6.0-6.7	>6.0			None		None
273C:	i i									
Olmitz	B	Medium								
			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				None		None
			October	6.5-6.7				None		None
			November	5.5-6.7	>6.0			None		None
			December	6.0-6.7	>6.0			None		None
324C2:	i i					į į		i i		
Dickman, moderately eroded	A	Low	ļ			ļ ļ				ļ
			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	table		Ponding	•	Floo	oding
	 Hydro- logic group	Surface runoff	 Month 	Upper	Lower	Surface water depth	Duration	Frequency	Duration	Frequenc
			i	Ft	Ft	Ft		i i		i i
,	i i		j	i i		i i		i i		į
324D2:										
Dickman, moderately eroded	A	Low								
ļ			January					None		None
!			February					None		None
ļ			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
54:]		
Aquolls, ponded										
			January	2.0-3.5				None		None
			February	1.5-3.0			Very long	Frequent		None
			March	0.5-2.0			Very long	Frequent		None
			April	0.0-1.0			Very long	Frequent		None
			May	0.5-2.0			Very long	Frequent		None
!			June	1.0-2.0	>6.0		Very long	Frequent		None
!			July	2.0-3.5	>6.0		Very long	Frequent		None
!			August	2.5-3.5			Very long	Frequent		None
ļ			September	3.0-4.0	>6.0	0.0-1.0	Very long	Frequent		None
!			October	2.5-3.5	>6.0	0.0-1.0	Very long	Frequent		None
!			November	1.5-3.0	>6.0	0.0-1.0	Very long	Frequent		None
ļ			December	2.0-3.5	>6.0			None		None
668:										
Macksburg	B	Very high	i	į į		į į		į i		i
į	ı i		January	3.0-5.5	>6.0	i i		None		None
i	ı i		February	2.5-5.0	>6.0	i i		None		None
į	İ		March	1.5-4.0	>6.0	i i		None		None
į	İ		April	1.0-3.5	>6.0	i i		None		None
· ·	ı i		May	1.5-4.0	>6.0	i i		None		None
· ·	ı i		June	2.0-4.5	>6.0	i i		None		None
· ·	į į		July	3.0-5.5	>6.0	i i		None		None
· ·	į i		August	3.5-6.0	>6.0	i i		None		None
· ·	i i		September			i i		None		None
· ·	i i		October	3.5-6.0		i i		None		None
	i i		November	2.5-5.0	>6.0	i i		None		None

		 		Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
369:	 	 								
Winterset	c	 Very high	İ	i i		i i		i i		i
	i	i	January	2.0-3.5	>6.0	i i		None		None
	İ	İ	February	1.5-3.0	>6.0	i i		None		None
	į	İ	March	0.5-2.0	>6.0	i i		None		None
	İ	İ	April	0.0-1.0	>6.0	i i		None		None
	İ	İ	May	0.5-1.5	>6.0	i i		None		None
	ĺ		June	1.0-2.0	>6.0	i i		None		None
	ĺ		July	2.0-3.0	>6.0	i i		None		None
	ĺ		August	2.5-3.5	>6.0	i i		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
370:		 								
Sharpsburg	В	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
370B:				į į		į į				į
Sharpsburg	В	Low				<u> </u>				ļ.
	ļ		January	6.0-6.7				None		None
	ļ		February	5.5-6.7				None		None
	ļ		March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None
			July	6.0-6.7				None		None
			August	6.5-6.7				None		None
			September					None		None
	1		October	6.5-6.7				None		None
			November	5.5-6.7				None		None
			December	6.0-6.7	>6.0			None		None

				Water	table		Ponding	r	Floo	ding
Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Upper limit	Lower	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
371C2:										
Sharpsburg, moderately	i i		i	i i		i i		i i		i
eroded	в	Medium	i	i i		i i		i i		i
	i i		January	6.0-6.7	>6.0	i i		None		None
	i i		February	5.5-6.7	>6.0	i i		None		None
	i i		March	4.5-6.5	>6.0	i i		None		None
	i i		April	4.0-6.0	>6.0	i i		None		None
	i i		May	4.5-6.5	>6.0	i i		None		None
	i i		June	5.0-6.7	>6.0	i i		None		None
	i i		July	6.0-6.7	>6.0	i i		None		None
	i i		August	6.5-6.7	>6.0	i i		None		None
	i i		September	6.5-6.7	>6.0	i i		None		None
	i i		October	6.5-6.7	>6.0	i i		None		None
	i i		November	5.5-6.7	>6.0	i i		None		None
	į į		December	6.0-6.7	>6.0	i i		None		None
Nira, moderately eroded	 B	Medium								
mara, moderatory order	-	1100110111	January	4.0-6.0	>6.0	i i		None		None
	i i		February	3.5-5.5		i i		None		None
	ii		March	2.5-4.5		i i		None		None
	ii		April	2.0-4.0		i i		None		None
	ii		May	2.5-4.5		i i		None		None
	ii		June	3.0-5.0		i i		None		None
	ii		July	4.0-6.0		i i		None		None
	i i		August	4.5-6.5		i i		None		None
	i i		September			i i		None		None
	i i		October	4.5-6.5		i i		None		None
	ii		November	3.5-5.5		i i		None		None
	į į		December	4.0-6.0		i i		None		None
371D2: Sharpsburg, moderately eroded	 	Medium								
e10deg	B	mealum	 Tamus =	16067	.6.0	 		None		l Want
			January	6.0-6.7				None		None
			February	5.5-6.7		1 1		None		None
			March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None
			July	6.0-6.7				None		None
			August	6.5-6.7				None		None
			September					None		None
			October	6.5-6.7				None		None
			November December	5.5-6.7				None		None None
				6.0-6.7	~ h n					

				Water	table		Ponding	·	Flooding	
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequenc
				Ft	Ft	Ft				
371D2:	i i		İ	į į		i i		į į		İ
Nira, 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				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				None		None
			August	4.5-6.5	>6.0			None		None
			September					None		None
			October	4.5-6.5	>6.0			None		None
			November	3.5-5.5				None		None
			December	4.0-6.0	>6.0			None		None
121C2:	i i									
Gara, moderately eroded	C	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
Bucknell, moderately						ļ ¦				
eroded	D	Very high	Į.	[<u> </u>		1
			January					None		None
			February					None		None
			March	1.5-2.0				None		None
			April	1.0-1.3				None		None
			May	1.3-1.5				None		None
			June	1.5-2.0				None		None
			July					None		None
			August					None		None
			September					None		None
			October	1.0-1.5				None		None
			November	1.5-2.0				None		None
	1 1		December	1.5-2.0	2 5 2 5			None		None

Map symbol	Duration	Frequenc
421D2:		
January None		None
		None
March None		None
April None		None
May None		None
		None
July None		None
August None		None
		None
		None
November None		None
		None
		i
Bucknell, moderately		i
eroded D Very high		i
January None		None
February None		None
March 1.5-2.0 2.5-2.5 None		None
April 1.0-1.3 2.5-2.5 None		None
May 1.3-1.5 2.5-2.5 None		None
June 1.5-2.0 2.5-2.5 None		None
July None		None
August None		None
		None
October 1.0-1.5 2.5-2.5 None		None
November 1.5-2.0 2.5-2.5 None		None
		None
421E2:		
January None		None
		None
March None		None
		None
May		None
June None		None
July None		None
August None		None
		None
		None
November None		None
		None
		1

				Water	table		Ponding	r	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month 	Upper limit	Lower limit	 Surface water depth	Duration	Frequency 	Duration	Frequency
			Į.	Ft	Ft	Ft				
404-0										
421E2:						!!!				
Bucknell, moderately eroded	-									
eroded	D D	Very high			 	 		None		None
		l I	January February					None		None
	l I	 	March	1	2.5-2.5	 		None		None
	l I	 	April		2.5-2.5			None		None
	l I	 	May		2.5-2.5	 		None		None
	l I	 	June	1.5-2.0		 		None		None
	l I	 	July		2.5-2.5	 		None		None
	l I	 	August					None		None
	l I	 	September			 		None		None
		 	October	1	2.5-2.5	 		None		None
		l I	November	1.5-2.0				None		1
		l I	December		2.5-2.5	 		None		None
	l I	 	December	1.5-2.0	2.5-2.5			None		None
135:		 	i					i i		i
Zook, occasionally flooded	C/D	Very high	i	i	i	i i		i i		i
	İ		January	2.0-3.5	>6.0	i i		None		None
	İ		February	1.5-3.0		i i		None	Brief	Occasion
	i		March	0.5-2.0	1	i i		None	Brief	Occasion
	i	 	April	0.0-1.0		i i		None	Brief	Occasion
	i	 	May	0.5-1.5		i i		None	Brief	Occasion
	i	 	June	1.0-2.0		i i		None	Brief	Occasion
	i	 	July	2.0-3.0		i i		None	Brief	Occasion
	i		August	2.5-3.5		i i		None	Brief	Occasion
	i	 	September			i i		None	Brief	Occasion
	i	 	October	2.5-3.5		i i		None	Brief	Occasion
	i	 	November	1.5-3.0		i i		None	Brief	Occasion
	İ		December	2.0-3.5	1	i i		None		None
			İ	ļ.	[! !		ļ
Mt. Sterling, occasionally flooded			1							
ilooded	В	Very high	 			 		1 27		None
		 	January	2.0-3.5		1 1		None		
		 	February	1.5-3.0				None	Brief	Occasion
			March	0.5-2.0				None	Brief	Occasion
			April	0.0-1.0				None	Brief	Occasion
			May	0.5-1.5				None	Brief	Occasion
			June	1.0-2.0				None	Brief	Occasion
		 -	July	2.0-3.0				None	Brief	Occasion
			August	2.5-3.5				None	Brief	Occasion
			September		1			None	Brief	Occasion
			October	2.5-3.5	1			None	Brief	Occasion
			November	1.5-3.0				None	Brief	Occasion
			December	2.0-3.5	>6.0			None		None

				Water	table	[Ponding	ı	Floc	ding
Map symbol	 Hydro-	 Surface	Month		Lower	 Surface	Duration	Frequency	Duration	Frequency
and soil name	logic	runoff	İ	limit	limit	water		i		i -
	group	ĺ	İ	İ	İ	depth		İ		İ
		1	1	Ft	Ft	Ft		I		I
	į	j	İ	İ	į	į į		İ		İ
469C2:	İ	ĺ	İ	İ	İ	į į		İ		İ
Lamoni, moderately eroded	C	Very high								
			January					None		None
			February					None		None
			March	1.5-2.0	2.5-2.5			None		None
			April	1.0-1.3	2.5-2.5			None		None
			May	1.3-1.5	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		2.5-2.5			None		None
			November	1.5-2.0	1			None		None
			December	1.5-2.0	2.5-2.5			None		None
Clarinda, moderately		!	!							!
eroded	- D	Very high	!							!
	!	!	January					None		None
	!	!	February	1.5-2.0	1			None		None
	!		March		2.0-2.0			None		None
			April		2.0-2.0			None		None
	!		May		2.0-2.0			None		None
			June	1.0-1.5				None		None
	-		July	1.5-2.0				None		None
			August					None		None
			September	1	2.0-2.0			None		None
		 	October November		1	 		None None		None None
		l I	December	1.5-2.0	2.0-2.0	 		None	 	None
	-	l I	December	1.5-2.0	2.0-2.0			None	 	None
Shelby, moderately eroded	C	 Medium	I I	 	 	 			 	
shelby, moderately eloded	-	Medium	January					None	 	None
		 	February					None	 	None
		 	March					None	 	None
	1	 	April					None		None
	1	 	May			 		None		None
	i	! 	June					None		None
	i	İ	July					None		None
	i	İ	August			 		None		None
	i	İ	September			 		None		None
	i	İ	October			i i		None		None
	i	İ	November			 		None		None
	i	İ	December	i		i i		None		None
	i	i	i	i	i	i i		i	I	1

				Water	table		Ponding	r	Floo	ding
Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Upper limit	Lower	 Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
469C3:		 			 	 				
Lamoni, severely eroded	c	 Very high	i		 			i i		i
	-		January			i i		None		None
	i	! 	February			i i		None		None
	i		March	1.5-2.0	2.5-2.5	i i		None		None
	i	İ	April	1.0-1.3	2.5-2.5	i i		None		None
	i	İ	May	1.3-1.5	2.5-2.5	i i		None		None
	i	İ	June	1.5-2.0	2.5-2.5	i i		None		None
	i	İ	July		i	i i		None		None
	i		August			i i		None		None
	i		September			i i		None		None
	i		October	1.0-1.5	2.5-2.5	i i		None		None
	i		November	1.5-2.0	1	i i		None		None
	į		December	1.5-2.0		i i		None		None
Clarinda, severely eroded	 D	 Very high			 	 				
	İ		January					None		None
	İ		February	1.5-2.0	2.0-2.0	i i		None		None
	İ		March	0.0-1.0	2.0-2.0	i i		None		None
	İ		April	0.0-1.0	2.0-2.0	i i		None		None
	İ		May	0.5-1.5	2.0-2.0	i i		None		None
	İ	İ	June	1.0-1.5	2.0-2.0	i i		None		None
	İ	İ	July	1.5-2.0	2.0-2.0	i i		None		None
	İ	İ	August		i	i i		None		None
	i	İ	September			i i		None		None
	İ	İ	October	1.0-1.5	2.0-2.0	i i		None		None
	İ	İ	November	1.5-2.0	2.0-2.0	i i		None		None
	į		December	1.5-2.0	2.0-2.0	i i		None		None
Shelby, severely eroded	 C	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
	1	I .	December					None		None

		 		Water	table		Ponding	J	Floo	ding
Map symbol	 Hydro-	Surface	 Month	Upper	Lower	 Surface	Duration	Frequency	Duration	Frequency
and soil name	logic	runoff	İ	limit	limit	water				i -
	group		İ	İ	İ	depth		j i		İ
			l	Ft	Ft	Ft				Ī
	į i		İ	į	İ	i i		j i		İ
170D2:	į i		İ	İ	İ	į į		j i		İ
Lamoni, moderately eroded	C	Very high	İ	İ	ĺ	į į		į į		İ
			January					None		None
			February					None		None
			March	1.5-2.0	2.5-2.5			None		None
			April	1.0-1.3	2.5-2.5			None		None
			May	1.3-1.5	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	1			None		None
			November	1.5-2.0	1			None		None
			December	1.5-2.0	2.5-2.5			None		None
	_									
Shelby, moderately eroded	C	Medium	-							
			January					None		None None
		l I	February					None		
		l I	March		 			None		None
		l I	April		 	 		None None		None None
			May June		 	 		None		None
		 	July		 	 		None		None
		 	August		 			None		None
	 	 	September		 	 		None		None
		 	October					None		None
		 	November					None		None
			December	i	 			None		None
545B:			i			i i				i
Zook	C/D	 Very high	i	İ	İ	i i		i		i
			January	2.0-3.5	>6.0	i i		None		None
	i i		February	1.5-3.0	>6.0	i i		None		None
	i		March	0.5-2.0	,	i i		None		None
	į i		April	0.0-1.0	>6.0	i i		None		None
	į i		May	0.5-1.5	>6.0	i i		None		None
	į į		June	1.0-2.0	>6.0	i i		None		None
	į į		July	2.0-3.0	>6.0	i i		None		None
	I i		August	2.5-3.5	>6.0	i i		None		None
	I i		September	3.0-4.0	>6.0	i i		None		None
	Į į		October	2.5-3.5	>6.0	i i		None		None
			November	1.5-3.0	>6.0			None		None
			December	2.0-3.5						

		 		Water	table		Ponding	·	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	 Month 	Upper	Lower limit	 Surface water depth	Duration	Frequency 	Duration	Frequency
				Ft	Ft	Ft				T
	ļ									
45B:	_									
Ely	В	Very high	!			!!!				
		 	January	3.0-5.5		 		None		None
		l I	February	2.5-5.0		!!!		None		None
		l I	March	1.5-4.0		 		None		None None
		l I	April	1.0-3.5		! !		None		1
		l I	May	1.5-4.0				None None		None None
		l I	June	3.0-5.5				None		None
		 	July	3.0-5.5				1 1		1
		l I	August			1 1		None		None
		 	September			 		None		None
		 	October	3.5-6.0		1 1		None		None
		 	November	3.0-5.5				None		None
		 	December	3.0-5.5	>6.0			None		None
Gullied land.										
69C:	l I	 								
050. Nira	В	Medium	i			i i		i i		1
	-		January	4.0-6.0	>6.0	i i		None		None
	1	 	February	3.5-5.5				None		None
	1	 	March	2.5-4.5				None		None
	1	 	April	2.0-4.0				None		None
	1	 	May	2.5-4.5				None		None
		 	June	3.0-5.0				None		None
		 	July	4.0-6.0				None		None
	1	 	August	4.5-6.5				None		None
		 	September					None		None
		 	October	4.5-6.5				None		None
		 	November	3.5-5.5				None		None
		 	December	4.0-6.0				None		None
	į	İ		j j		i i		i i		į
Clearfield	C	Very high								
			January	2.0-3.5				None		None
			February	1.5-3.0				None		None
	!		March	0.5-2.0				None		None
	!		April	0.0-1.0				None		None
	!		May	0.5-1.5				None		None
	!		June	1.0-2.0				None		None
	[July	2.0-3.0				None		None
	!		August	2.5-3.5				None		None
	[September					None		None
			October	2.5-3.5				None		None
			November	1.5-3.0				None		None
			December	2.0-3.5				None		None

		Water table			Ponding	r	Floo	ding		
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	 Surface water depth	Duration	Frequency 	Duration	Frequenc
				Ft	Ft	Ft				
79E3:		 	l I		 					
Bucknell, severely eroded	 D	 Very high	-		 			1		
backmerr, beverery croaca		very migh	January		 			None		None
			February		 			None		None
			March	1.5-2.0	1	 		None		None
		 	April	1.0-1.3		 		None		None
			May	1.3-1.5		 		None		None
			June	1.5-2.0		i i		None		None
		 	July			i i		None		None
		 	August			i i		None		None
		 	September			i i		None		None
		 	October	1.0-1.5	1	i i		None		None
		 	November	1.5-2.0		i i		None		None
	i		December	1.5-2.0		i i		None		None
	į į		İ	İ	ĺ	į į		į į		İ
Hedrick, severely eroded-	- в	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
	į į		May	2.5-4.5	>6.0	i i		None		None
	į į		June	3.0-5.0	>6.0	i i		None		None
	į į		July	4.0-6.0	>6.0	i i		None		None
	j i	ĺ	August	4.5-6.5	>6.0	i i		None		None
	į į		September	5.0-6.7	>6.0	i i		None		None
	į į		October	4.5-6.5	>6.0	i i		None		None
	į į		November	3.5-5.5	>6.0	i i		None		None
			December	4.0-6.0	>6.0			None		None
94C2: Armstrong, moderately		 	 	 	 	 				
eroded	- C	Very high								
			January			i i		None		None
	į į		February			i i		None		None
			March	1.5-2.0	2.5-2.5			None		None
	į į		April	1.0-1.3	2.5-2.5	i i		None		None
	į į		May	1.3-1.5	2.5-2.5	i i		None		None
			June	1.5-2.0	2.5-2.5	i i		None		None
			July			i i		None		None
			August	j	i	i i		None		None
			September		i	i i		None		None
			October	1.0-1.5	2.5-2.5	i i		None		None
			November	1.5-2.0	2.5-2.5	i i		None		None

		 		Water	table	[Ponding	r	Floc	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	 Surface water depth	Duration	Frequency	Duration	Frequency
			İ	Ft	Ft	Ft		İ		Ī
			İ	ļ	ļ			! !		İ
794C2:										
Ladoga, moderately eroded	В	Medium	!_							
			January	6.0-6.7				None		None
			February March	5.5-6.7 4.5-6.5		 		None None		None None
		 	April	4.0-6.0				None		None
		 	May	4.5-6.5				None		None
		 	June	5.0-6.7				None		None
		 	July	6.0-6.7		 		None		None
			August	6.5-6.7		 		None		None
		 		6.5-6.7		i		None		None
		 	October	6.5-6.7		i i		None		None
			November	5.5-6.7		i i		None		None
			December	6.0-6.7		i i		None		None
822D2:					 					
Lamoni, moderately eroded	C	Very high								
			January					None		None
			February					None		None
			March	1	2.5-2.5			None		None
			April		2.5-2.5			None		None
			May	1	2.5-2.5			None		None
			June	1	2.5-2.5	: :		None		None
			July					None		None
			August					None		None
			September					None		None
			October	1	2.5-2.5			None		None
			November		2.5-2.5			None		None
			December	1.5-2.0	2.5-2.5 	 		None		None
870B: Sharpsburg, terrace	 B	Low			 					
21111722113, 0011100	-		January	6.0-6.7	>6.0	i		None		None
		 	February	5.5-6.7		i		None		None
		 	March	4.5-6.5		i i		None		None
	i		April	4.0-6.0		i i		None		None
	i		May	4.5-6.5		i i		None		None
	i		June	5.0-6.7		i i		None		None
	i		July	6.0-6.7		i i		None		None
	i		August	6.5-6.7		i i		None		None
	i	İ	September	6.5-6.7		i i		None		None
	i		October	6.5-6.7		i i		None		None
	i		November	5.5-6.7		i i		None		None
	1		December	6.0-6.7	>6.0	i i		None		None

				Water	table		Ponding		Flooding		
Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Upper limit	Lower limit	Surface water depth	Duration	Frequency 	Duration	Frequency	
] [1	Ft	Ft	Ft		! !			
870C2:				 	 	 					
Sharpsburg, terrace,	1 1				 	; ;				1	
moderately eroded	B	Medium			 	; ;				1	
moderatery croded	-	ncaram	January	6.0-6.7	 >6 0	 		None		None	
	1 1		February	5.5-6.7				None		None	
	i i		March	4.5-6.5		i i		None		None	
	1 1		April	4.0-6.0				None		None	
	1 1		May	4.5-6.5				None		None	
	1 1		June	5.0-6.7				None		None	
	1 1		July	6.0-6.7	'	 		None		None	
			August	6.5-6.7				None		None	
			September					None		None	
			October	6.5-6.7	'			None		None	
			November	5.5-6.7				None		None	
			December	6.0-6.7				None		None	
			December	0.0-6.7	>0.0			None		None	
07000					 						
870D2:				!		!!!		! !		1	
Sharpsburg, terrace,				!		!!!		!			
moderately eroded	В	Medium				!!!					
	!!!		January	6.0-6.7				None		None	
	!!!		February	5.5-6.7				None		None	
	!!!		March	4.5-6.5				None		None	
	!!!		April	4.0-6.0				None		None	
			May	4.5-6.5				None		None	
			June	5.0-6.7				None		None	
			July	6.0-6.7				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	
876B:											
Ladoga, terrace	B	Low									
			January	6.0-6.7	>6.0			None		None	
	į į		February	5.5-6.7	>6.0	i i		None		None	
	i i		March	4.5-6.5	>6.0	i i		None		None	
	i i		April	4.0-6.0	>6.0	i i		None		None	
	i i		May	4.5-6.5	>6.0	i i		None		None	
	į į		June	5.0-6.7	>6.0	i i		None		None	
	į į		July	6.0-6.7		i i		None		None	
	i i		August	6.5-6.7		i i		None		None	
	j i		September			i i		None		None	
	i i		October	6.5-6.7		i i		None		None	
	1 1		November	5.5-6.7	'			None		None	
	1 1		December	6.0-6.7				None		None	
	1 1		, = 0000000	12.0		! !		1		, 110113	

				Water	table		Ponding		Floc	oding
Map symbol and soil name	Hydro- logic group	Surface runoff	Month 	Upper limit	Lower limit	Surface water depth	Duration	Frequency 	Duration	Frequency
				Ft	Ft	Ft				
										1
876C2:				!!!		! !		!!!		
Ladoga, terrace,										
moderately eroded	В	Medium								
			January	6.0-6.7				None		None
			February	5.5-6.7				None		None
			March	4.5-6.5				None		None
			April	4.0-6.0				None		None
			May	4.5-6.5				None		None
			June	5.0-6.7				None		None
			July	6.0-6.7				None		None
			August	6.5-6.7				None		None
			September					None		None
			October	6.5-6.7				None		None
			November	5.5-6.7				None		None
			December	6.0-6.7	>6.0			None		None
876D2:										
Ladoga, terrace,										
moderately eroded	В	Medium								
			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
2368B:	į į			į į		į į		į į		İ
Macksburg	В	Very high								
	į į		January	3.0-5.5	>6.0	i i		None		None
	į į		February	2.5-5.0	>6.0	j j		None		None
	į i		March	1.5-4.0	>6.0	i i		None		None
	i i		April	1.0-3.5	>6.0	i i		None		None
	i		May	1.5-4.0		i i		None		None
	į į		June	2.0-4.5	>6.0	i i		None		None
	i		July	3.0-5.5		i i		None		None
	i		August	3.5-6.0		i i		None		None
	i		September			i i		None		None
	i		October	3.5-6.0		i i		None		None
	i		November	2.5-5.0		i i		None		None
	i		December	3.0-5.5		i i		None		None
	1	! !	1			1 1				1

				Water	table		Ponding	r	Floo	ding
Map symbol and soil name	 Hydro- logic group	Surface runoff	 Month	Upper	Lower	Surface water depth	Duration	Frequency	Duration	Frequenc
			i	Ft	Ft	Ft		1		i i
	i i		i			-		i i		i
2368B:	i i		į	j j		i i		j i		İ
Nira	B	Low	ĺ	į į		į į		į į		ĺ
			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
	į į		August	4.5-6.5	>6.0	j j		None		None
	į į		September	5.0-6.7	>6.0	j j		None		None
	į į		October	4.5-6.5	>6.0	j j		None		None
	i i		November	3.5-5.5	>6.0	j j		None		None
	į į		December	4.0-6.0	>6.0	j j		None		None
5030. Pits, limestone quarries										
•	i i		į	i i		i i		i i		İ
5040. Udorthents, loamy										
			ļ							
5041. Udorthents, reclaimed										
AW.										
Animal waste lagoon										
SL.										İ
Sewage lagoon			-							
Denage rayoon			-							
٧.										1
v. Water										I I
Macer	!!!		1	1		1 1		1 1		I

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. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

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

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

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

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

Soil Features

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

Map symbol	Restrictive la	ıyer	 Potential	Risk of	corrosion
and soil name	Kind	Depth to top	for frost action	Uncoated steel	 Concrete
İ		In	<u> </u>	<u> </u>	
7: Wiota, rarely flooded			 High	 Moderate	 Moderate
7B: Wiota, rarely flooded			 High	 Moderate	 Moderate
				 	Moderace
8B: Judson 			 High 	 Moderate 	 Low
15B: Olmitz		 	 Moderate	 Moderate 	 Moderate
Ely			High	 High	Moderate
Zook			 High 	 High 	 Moderate
16: Nodaway, occasionally flooded			 High	 Moderate	Low
Kennebec, occasionally flooded			 High	 Moderate	Low
24C2: Shelby, moderately eroded			 Moderate	 Moderate 	 Moderate
24D2: Shelby, moderately eroded			 Moderate	 Moderate	 Moderate
24E: Shelby		 	 Moderate 	 Moderate 	 Moderate
24E2: Shelby, moderately eroded			 Moderate	 Moderate	 Moderate
24F: Shelby			 Moderate	 Moderate 	 Moderate
43: Bremer, rarely flooded			 High	 Moderate	 Moderate
45B: Zook			 High	 High	 Moderate
Ely			High	 High	 Moderate
54: Zook, occasionally flooded			 High	 High	 Moderate
54+: Zook, occasionally flooded, overwash			 High 	 High 	 Moderate

Soil Features--Continued

Map symbol	Restrictive la	yer	 Potential	Risk of corrosion		
and soil name	 Kind	Depth to top	for frost action	Uncoated steel	Concrete	
	1	In			1	
76B: Ladoga	 	 	 Moderate	 Moderate	 Moderate 	
76C: Ladoga	 	i 	 Moderate	 Moderate	 Moderate	
76D: Ladoga	 		 Moderate 	 Moderate 	 Moderate 	
76D2: Ladoga, moderately eroded	 	 	 Moderate	 Moderate 	 Moderate 	
86: Mt. Sterling, occasionally flooded	 	 	 High 	 High	 Low 	
Zook, occasionally flooded, overwash	 		 High 	 High 	 Moderate 	
88: Nevin, rarely flooded	 		 High 	 High 	Low	
93D2: Shelby, moderately eroded	 	 	 Moderate	 Moderate	 Moderate	
Adair, moderately eroded	 Abrupt textural change	5-9	 High 	 High 	 Moderate 	
93E2: Shelby, moderately eroded	 	 	 Moderate	 Moderate	 Moderate	
Adair, moderately eroded	 Abrupt textural change	 5-9 	 High 	 High 	 Moderate 	
172: Wabash, frequently ponded, occasionally flooded		 	 Moderate	 High	 Moderate	
179E: Gara	 		 Moderate	 Moderate 	 Moderate 	
179F: Gara	 		 Moderate	 Moderate 	 Moderate 	
179G: Gara	 		 Moderate 	 Moderate 	 Moderate 	
192D2: Adair, moderately eroded	 - Abrupt textural change	 5-9 	 High 	 High 	 Moderate 	
220: Nodaway, occasionally flooded	 	 	 High 	 Moderate 	 Low 	

Soil Features--Continued

Map symbol	Restrictive la	yer	 Potential	Risk of	Risk of corrosion		
and soil name	 Kind	Depth to top In	for frost action	Uncoated steel	Concrete		
222C2: Clarinda, moderately eroded	 Abrupt textural change	In 5-9	 High 	 High 	 Moderate 		
222D: Clarinda	 Abrupt textural change	 5-9 	 High 	 High 	 Moderate 		
222D2: Clarinda, moderately eroded	 Abrupt textural change	 5-9 	 High 	 High 	 Moderate 		
222D3: Clarinda, severely eroded	 Abrupt textural change	 5-9 	 High 	 High 	 Moderate 		
248: Wabash, occasionally ponded, occasionally flooded	 	 	 Moderate 	 High	 Moderate		
269: Humeston, occasionally flooded	 	 	 High 	 High 	 Moderate 		
273B: Olmitz	 	 	 Moderate 	 Moderate 	 Moderate 		
273C: Olmitz	 	 	 Moderate	 Moderate 	 Moderate		
324C2: Dickman, moderately eroded	 	 	 Moderate	 Low	 Moderate		
324D2: Dickman, moderately eroded	 	 	 Moderate	 Low	 Moderate		
354. Aquolls, ponded	 			 			
368: Macksburg	 	 	 High	 High	 Moderate		
369: Winterset	 		 High	 High	 Moderate		
370: Sharpsburg	 	 	 High	 Moderate	 Moderate		
370B: Sharpsburg	 		 High	 Moderate	 Moderate		
371C2: Sharpsburg, moderately eroded	 	 	 High	 Moderate	 Moderate		
Nira, moderately eroded	 	 	 High 	 Moderate 	 Moderate 		

Soil Features--Continued

	Dogtwigting la		Risk of corrosion				
Map symbol	Restrictive la		Potential				
and soil name		Depth	for	Uncoated			
	Kind	to top	frost action	steel	Concrete		
		In					
0.7.1.7.0							
371D2:		 		 			
Sharpsburg, moderately eroded	 	 	 TT:	 	1.50-3		
eroded			High	Moderate	Moderate		
Nira, moderately eroded	 	 	 High	Moderate	 Moderate		
Mila, modelately croaca	! [Moderate			
421C2:	l I	! 	İ	! 	i I		
Gara, moderately eroded			Moderate	Moderate	Moderate		
		İ					
Bucknell, moderately		İ	İ		İ		
eroded	Abrupt textural	5-9	Moderate	High	Moderate		
	change	ĺ	İ		ĺ		
		ĺ	İ		ĺ		
421D2:							
Gara, moderately eroded			Moderate	Moderate	Moderate		
Bucknell, moderately							
eroded	Abrupt textural	5-9	Moderate	High	Moderate		
	change		!				
421E2:							
Gara, moderately eroded			Moderate	Moderate	Moderate		
Bucknell, moderately	 	 	l I	l I	l I		
eroded	Abrupt tortural	 5-9	Moderate	 High	 Moderate		
eroded	change	3-3	Moderace	nign	Moderace		
	Change	 	 	 	 		
435:	l I	! 	İ	! 	l I		
Zook, occasionally		İ	i		İ		
flooded	i		High	High	Moderate		
		İ	i	İ	İ		
Mt. Sterling,	İ	İ	İ	İ	j		
occasionally flooded			High	High	Low		
469C2:							
Lamoni, moderately							
eroded	_	5-9	Moderate	High	Moderate		
	change	 					
Clarinda madamatal.	 	 	l I	 	 		
Clarinda, moderately eroded	Abrupt tortural	 5-9	 High	 High	 Moderate		
eroded	change	3-3	mign	nign	Moderace		
	Change	 	 	 	 		
Shelby, moderately	1	 	 	 	! 		
eroded			Moderate	Moderate	Moderate		
		İ					
469C3:	İ	İ	İ	İ	İ		
Lamoni, severely eroded	Abrupt textural	5-9	Moderate	High	Moderate		
	change						
Clarinda, severely							
eroded	Abrupt textural	5-9	High	High	Moderate		
	change						
al all and			 arada r	lae. 4.	 Ten de la la la la la la la la la la la la la		
Shelby, severely eroded			Moderate	Moderate	Moderate		
47002 -	 	 	1	 	 		
470D2:	 	 	I I	 	l I		
Lamoni, moderately	 Absumb toto		 Moderate	 u:ab	 Madama+-		
eroded	_	5-9 	Moderate	High	Moderate		
	change	 	I I	 	I I		
Shelby, moderately	 	 	 	 	I 		
eroded		 	Moderate	Moderate	 Moderate		
	İ	İ			, 		
	I .	1	1	I .	I .		

Soil Features--Continued

Map symbol	Restrictive la	yer	 Potential	Risk of corrosion		
and soil name	 Kind	Depth to top	!	Uncoated steel	Concrete	
	ĺ	In	İ	İ	İ	
	[ļ		ļ	
545B: Zook		 	 High	 High	 Moderate	
Ely	 	 	 High	 High 	 Moderate	
Gullied land.	 	 	 	 	 	
569C:	 		İ	 		
Nira	 	i	High	 Moderate 	Moderate	
Clearfield	 	 	 High 	 High 	Low	
579E3: Bucknell, severely eroded	 Abrupt textural change	 5-9	 Moderate 	 High 	 Moderate 	
Hedrick, severely eroded	 	 	 High 	 Moderate 	 Moderate 	
794C2: Armstrong, moderately eroded	 	 	 High 	 High	 Moderate	
Ladoga, moderately eroded	 	 	 Moderate	 Moderate 	 Moderate 	
822D2: Lamoni, moderately eroded		 5-9	 Moderate	 High	 Moderate	
	change					
870B: Sharpsburg, terrace	 	 	 High 	 Moderate 	 Moderate 	
870C2: Sharpsburg, terrace, moderately eroded	 	 	 High	 Moderate	 Moderate	
870D2: Sharpsburg, terrace, moderately eroded	 	 	 High	 Moderate	 Moderate	
876B: Ladoga, terrace	 	 	 Moderate 	 Moderate 	 Moderate 	
876C2: Ladoga, terrace, moderately eroded	 	 	 Moderate	 Moderate	 Moderate	
876D2: Ladoga, terrace, moderately eroded	 	 	 Moderate	 Moderate	 Moderate	
2368B: Macksburg	 	 	 High	 High	 Moderate	
Nira		 	 High	 Moderate	 Moderate	
5030. Pits, limestone quarries	 	 	 	 	 	

Soil Survey of Adams County, Iowa—Part II

Soil Features -- Continued

Map symbol and soil name	Restrictive layer			Risk of corrosion	
		Depth	Potential for		
				Uncoated	
	Kind	to top	frost action	steel	Concrete
		In		I	
5040.					
Udorthents, loamy					
5041:					
Udorthents, reclaimed					
. W.					
Animal waste lagoon					
SL.					
Sewage lagoon		j	į į	ĺ	
			į į	ĺ	
1.			į į	ĺ	
Water			i i	ĺ	
į		İ	i i	i	

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